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ABSTRACT

During March, April, and May of 1970 the Select Subcommittee on Education of the United States House of Representatives held hearings in Washington, D.C., New York City, and San Francisco and Los Angeles, California, on a "bill to authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance." The record of these hearings contains testimony from a wide cross-section of the population: ecologists, such as LaMont Cole; social scientists, such as Margaret Mead and Kenneth Boulding; student leaders of the Environmental Teach-In, such as Karen Buxbaum; an artist, Robert Motherwell; a theologian, Josephy Sittler; educators, such as Edward Weidner; government officials, such as James E. Allen; and, philosophers, conservationists, businessmen, architects, journalists, teachers. The testimony ranges from very high level, abstract, global thinking to detailed descriptions of specific action programs. The record has been carefully edited and condensed in order to present the essential themes, and a wide variety of viewpoints. There are many uses for this book: curriculum planners and teachers will find many of the proposals helpful in guiding their own thinking; both high school and college classes in education and government will find this an illuminating source of information on how national priorities are formulated; and, study groups focusing on environmental problems will find it a stimulating case study. (Author)

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the ENVIRONMENTAL PROBLEM

SELECTIONS from HEARINGS ON the ENVIRONMENTAL EDUCATION ACT of 1970

With a Preface by the Honorable John Brademas,
Chairman of the Select Subcommittee on Education, Committee on Education and Labor,
U. S. House of Representatives.

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the ENVIRONMENTAL PROBLEM

SELECTIONS from HEARINGS on the ENVIRONMENTAL EDUCATION ACT of 1970

edited by

Irving Morrissett and Karen B. Wiley

with a preface by John Brademas

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FOREWORD

The editors undertook to prepare this volume in the belief that the extensive reservoir of government documents in this country could provide a valuable learning resource. Unfortunately, such documents, in their original forms, are quite unmanageable for normal classroom and study group use. They are exceedingly voluminous and lack detailed reading aids such as indices and content summaries. The editors have attempted to develop an example of how such documents—in this case, the record of the hearings before the House Subcommittee on Education on the Environmental Education Act of 1970—might be made more usable. They have pared the original 856-page document to a more readable length while taking care to retain its essential ideas and flavor. Through summaries in the general and chapter introductions, and by indexing the content of the volume, they have sought to give the reader additional help in using the record of the hearings.

Many people were involved in the preparation of this publication. Celeste P. Woodley, Nicholas Helburn, Mary Frances Haley, Dennis Ekhart, Joyce Hodges, and James O. Hodges read and commented on portions of the manuscript. W. Williams Stevens, Jr., and James E. Davis gave much needed encouragement and support. Congressman John Brademas and his staff prepared the preface and came to the rescue several times in answering questions. Gabrielle Cooke rendered invaluable assistance in proofreading, layout, and design. Nancy Vickery and Ellen Schultheis battled with scissors, paste, and typewriter ribbon in preparing the manuscript for the printer. The cover was designed by John Harris. Gary Peschel, of Pruett Press, gave much needed advice on production matters.

Irving Morrissett
Karen B. Wiley
Boulder, Colorado
1971

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PREFACE

The awakening concern, especially among young people, of the dangers to our environment, goes far beyond protests against the pollution of land, air, and water. I believe that the rapidly rising awareness of the environmental crisis in America today reflects a deepening sensitivity to the fundamental values of human life.

Indeed, it seems to me not too much to say that if we do not allow the current intense preoccupation with the issues of ecology to fizzle out and wither away, the new awareness of the deteriorating environment and of its implications for the future of human life can have a profoundly regenerative effect on every aspect of our society.

There have been many descriptions of the ways in which we have befouled the environment of which we are a part. Yet few persons have so eloquently summed up the situation than did the distinguished contemporary American painter, Robert Motherwell, when he testified before my congressional subcommittee during the hearings which are the subject of this book. Here is what Motherwell said:

> I suppose America began as a few people on a vast tract of land, so vast that one could be as greedy and wasteful as one wanted, and there was still more. That time is gone. Now there are millions of people and millions more in the offing, and the vast land is a park filled with waste—rusting cars, bottles, garbage, enormous signs seducing you to buy what you don't want or need, housing projects that don't show a rudimentary sense of proportion in any shape or line or material—suburbs that are a parody of the barrenness of the Bronx and the gaudiness of Las Vegas.
>
> Indeed, if God had said to a group of men, "Here is a vast park of millions of square miles. Let's see how quickly you can cover it with everything that is an affront to the human spirit, and above all be certain that it is done on a scale of such extravagance and waste and lack of regard for the sensibilities of the inhabitants of the other parks in the world," then we might by definition call that group of men that God so addressed Americans.
>
> No wonder our youth are up in arms!

In recent years the Congress of the United States and successive presidents have moved to respond to this frontal assault on what Kenneth Boulding has called "spaceship earth." Senators Edmund S. Muskie of Maine and Gaylord Nelson of Wisconsin and many others in Congress have helped write a whole series of measures aimed at enhancing our capacity to protect the environment and prevent its pollution.

Yet I believe—and I do not think that champions of clean air, land, and water would disagree—that if we are to be able to make substantial progress in meeting our ecological crisis, we are going to need a citizenry informed and educated about the whole spectrum of issues that are called environmental; and we are going to require as well changes in basic attitudes toward the environment and man's place in it.

That is why on February 17, 1970, several colleagues and I in the House of Representatives introduced the Environmental Education Act, a bill to authorize federal funds to support elementary and secondary school courses on ecology, as well as curriculum development and teacher training for environmental studies.

On October 30, 1970, President Nixon signed this measure into law, but not until after 13 days of the public hearings, which are the subject of this book, and after several more "markup" sessions on the part of the Select Education Subcommittee of the Education and Labor Committee of the House of Representatives.

The process by which an idea for a legislative proposal finally becomes a law varies from measure to measure but within broad outlines the steps are similar.

Initiatives for new bills come from many sources: someone in the executive branch of the government, a spokesman for an interest group, a professor, or a businessman. In the case of the Environmental Education Act, however, the concept was generated from within Congress. Four members of the House of Representatives—two Democrats, James Scheuer of New York and I, and two Republicans, Ogden Reid of New York and Orval Hansen of Idaho—collaborated to draft the bill. The four of us, all concerned about the environmental crisis and all members of the congressional committee with responsibility for education legislation, became convinced that new approaches and new content in education could play a significant role in producing the informed citizenry we need to meet the spectrum of problems we call environmental.

Senator Nelson, the Wisconsin Democrat, who had established himself as a principal spokesman in the Senate on environmental questions, introduced an identical bill there, for to become law, of course, a bill must be passed by both houses of Congress.

The House bill was referred to the Education and Labor Committee and by its chairman, Carl D. Perkins, Democrat of Kentucky, to the Select Education Subcommittee, which I chair.

Because the bill originated in the House, we gave it extended consideration, starting with hearings in Washington on March 24, 1970, and continuing in New York City, San Francisco, and Los Angeles.

These hearings, like other congressional hearings, serve to inform the committee members of key issues raised by the legislative proposals; afford a forum for suggestions for improvement by expert witnesses; and give public visibility to a significant national problem.

Among those testifying on the Environmental Education Act were ecologists like LaMont Cole; educators such as Edward Weidner; the economist, Kenneth Boulding; and anthropologist, Margaret Mead; and students like Karen Buxbaum, Bryce Hamilton, and Denis Hayes, for young people have contributed richly to the new sensitivity to ecology.

We listened as well to some voices that might not have been expected to testify before Congress on such a bill. The painter, Robert Motherwell, and Joseph Sittler, a theologian from the University of Chicago, were invited to lead off the hearings because we wanted to establish at the outset that in discussing the environmental crisis, we were talking about far more than dirty air, land, and water. Rather, we were discussing the fundamental values of human life.

As Professor Sittler said:

> What man does with the world-as-nature is a result of what he *thinks* about nature; it is shaped in the profoundest care of what he *feels* about the natural world, what evaluation he has of the world of things and plants and animals.
>
> . . . And when man so uses nature as to deny her integrity, defile her cleanliness, disrupt her order, or ignore her needs—the reprisals of insulated nature often take a slow but terribly certain form. Nature's protest against defilement is ecological reprisal.

If there was one theme, then, that emerged again and again during our hearings, it was that we must have basic changes in our values and in our attitudes toward the environment of which we are a part, and that education, especially in schools, could play a significant part in shaping those values and attitudes.

I should like here to pay tribute to the able legislators whose initiative and effort were chiefly responsible for writing the Environmental Education Act into law—to Congressmen James Scheuer and Ogden Reid of New York, one an urban, the other a suburban legislator, but both men deeply sensitive to the environmental challenge, as were two other outstanding Representatives, both from the West, Lloyd Meeds of Washington and Orval Hansen of Idaho. As I have said, principal credit for Senate approval of the legislation must be assigned to Senator Nelson.

I must also here not fail to pay tribute to the splendid work of the staff of the Select Education Subcommittee, in particular to the Subcommittee Counsel, Jack Duncan, and to Arlene Horowitz, Ronald Katz, Martin LaVor, and Maureen Orth. Miss Orth made an especially valuable contribution through her imaginative scheduling of witnesses for the hearings.

The actions of congressmen in hearing testimony before the subcommittee and then in amending and modifying the original bill where necessary and appropriate during "markup" sessions, are usually the most detailed work done in writing new laws.

After a subcommittee has approved a bill, as the Select Education Subcommittee approved the Environmental Education Act on June 24, 1970, the measure is "reported out" to the full committee, which can further amend it. A favorable vote by the Committee on Education and Labor sent this bill to the floor of the House of Representatives, which passed it by a vote of 228 to 28, on August 3, 1970. The Senate approved it, 68 to 0, on September 9, 1970.

When the Senate and House pass different versions of a bill, it is common for a conference committee, composed of members of the Senate and House committees which handled the legislation, to write a compromise bill. In the case of the Environmental Education Act, however, the Senate accepted the House bill in its entirety, and it became the law of the land with the president's signature.

I should here make clear that the signing of a law authorizing a program does not mean that funds to carry it out automatically become available. Congress must then pass a separate bill appropriating the money.

As I write, Congress has approved an expenditure of $2 million for the current 1971 fiscal year for programs authorized by the Environmental Education Act. The administration of President Nixon, which originally opposed passage of the Environmental Education Act and subsequently opposed any appropriations for it, is now, I am pleased to say, considering applications for grants under the new law.

Unfortunately, the present administration has not yet given any evidence of long-term commitment to adequate financial support of environmental education. It is also, however, accurate to state that we in Congress, both Democrats and Republicans, have, with passage of the Environmental Education Act, made clear our conviction that sound environmental action presupposes a citizenry informed and educated about the environment.

But, even given adequate funds a law, to be effective, must be more than ink on paper. The efforts of business and industry and government on all levels, the commitment of citizen groups and the actions of concerned individuals, are what make laws have real effect on the society in which we live.

I hope, therefore, that this book of selections from the hearings will encourage and inspire its readers to make their own contributions to the education of Americans about our environment.

John Brademas
May 1971

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INTRODUCTION

From time to time in the United States an issue rises to the surface of the collective consciousness, taking on the form of a national debate. The issue may have been long-existing but dormant, or it may be a response to a new problem, or it may be a new coalescence of a number of previously separate and distinct minor issues.

These national issues draw a great number of citizens into active discussion over questions of national priorities and their reflection in public policy. They provide the occasions for galvanizing usually vaguely organized and inert mass opinions into significant forces affecting the society's decision-making processes.

Such was the case with the debate over the relations between England and its American colonies, which led to the Revolutionary War; the concern over federal-state relations, which was heralded in the *Federalist Papers*; the Hamilton-Jefferson conflict over the roles of industry and agriculture in early United States society; the public examination of the slavery issue, which led to the Civil War; and the debate over the roles of gold and silver in our monetary and economic systems. In the twentieth century, issues which have grown to national debates include the criticism of big business in the Muckraking Era, women's suffrage, United States participation in the League of Nations, the debate in the 1930s over the economic role of the federal government, the stringent post-Sputnik criticisms of our educational system, and the Civil Rights Movement of the 1960s.

A New Issue Blooms

During the winter of 1969-70, the "environmental problem" welled up through our subconscious to the full, bright light of national examination. Numerous little worries which previously had seemed not to be connected suddenly were revealed to be closely related and interdependent. Planned Parenthood found an ally in the Sierra Club. The voices of conservationists and ecologists who had long been crying in the wildnerness were suddenly amplified and listened to. Rachel Carson's *Silent Spring* and Aldo Leopold's *Sand County Almanac* were put back on the presses. Diverse segments of the population suddenly devoted their utmost attention to the "unifying" focus of environmental deterioration. The environmental horror stories in Paul Ehrlich's *Population Bomb* gripped the nation. New terms such as "ecology" were added to the national vocabulary and nearly everyone began having opinions on topics heretofore relegated to eccentric groups of birdwatchers and outdoor freaks. The mass media, private nonprofit groups, big business, schools and universities, student organizations, politicians—all began to discuss questions of environmental quality and their relationship to the work of their own groups.

Why the uproar? Why now? This country has experienced similar upsurges of concern about the state of the natural environment in the past, during the Conservation Movement of the early 1900s and again during the Dust Bowl of the '30s. But, some have claimed, the level of citizen concern during these periods was not nearly so high-pitched and fearful, nor was the scope so broad and all-encompassing as today's (see page 153). Why did 1970 become the Year of the Environment? Are we, at this particular time in our history, experiencing a sudden and vastly increased awareness of environmental problems that goes far beyond the concerns of the earlier conservation movements? And if so, why?

Some observers of the American scene have suggested that, with the divisiveness of current issues, such as the Vietnam war, poverty, and racial discrimination, the country feels a need for some significant issue which can "bring us together." Others have cynically suggested that the concentration on environmental problems by the mass media and politicians is a consciously planned effort by the Establishment to divert Americans' attention from those crucial questions (see page 84). Margaret Mead has described the sense of catastrophe and despair which plagues the post-bomb generation as providing fertile ground for the growth of environmental concern; the environmental issue expresses despair while, at the same time, it gives a sense of hope (83). But no one seems to have an entirely convincing answer to the "Why now?" question.

There can, however, be little doubt that environmental quality has been raised to a level of high national concern. The sudden deluge of coverage by the mass media and the

flurry of bills presented to national, state, and local legislative bodies demonstrate that the citizenry has become involved in a national debate over the goals and priorities of the country. Governmental bodies across the country have begun moving into action, attempting to fulfill their roles in providing major forums for debate on and resolution of problems of a public nature. Interest groups, lobbyists, politicians, and bureaucrats who have worked in the conservation field for years have been quick to take advantage of the new receptivity among their colleagues. They now appear to have the active grass-roots support to follow through on programs they have carried around in their hip pockets for years.

Nature of the Hearings

The progress of the Environmental Education Act of 1970 through Congress provides an excellent example of the workings of the federal legislative process on questions of significant national concern. The legislative process at the federal level involves a number of mechanisms designed to pull together the multiplicity of interests of the citizenry on major national questions and combine them into authoritative legal instruments for implementing the public's collective will. John Brademas, in his preface to this book, describes the process by which the Environmental Quality Education Bill became law. The hearings before the Select Subcommittee on Education of the House of Representatives reflect one of many steps in the process of pulling together diverse viewpoints and meshing them into a coherent public policy.

In the case of the Environmental Education Act of 1970, debate was focused on one possible area—education—in which at least some partial solutions to the environmental problem were expected to lie. The task of the subcommittee was to explore the ideas of concerned interest groups and individuals on how the vehicle of education might be employed in improving the quality of the environment.

The subcommittee took pains to assure that as many viewpoints as possible be heard. During the hearings, members of the subcommittee* listened to the testimony of 83 witnesses and received written statements from an additional 30 persons not present at the hearings. They included high school and college students, university and school personnel, pro- and anti-Establishment witnesses, representatives of labor and business, conservationists and polluters, natural and social scientists, scholars and practitioners.

The selections presented in this book include portions of testimony from 45 of the subcommittee witnesses, representing about one third of all the testimony heard. The fact that the full text of the hearings is so packed with ideas, information, and lively dialogue made the editors' task of selection very difficult. The principal selection criteria used by the editors were (1) representation of a wide variety of viewpoints with respect to the nature, causes, and cures of the environmental problem; (2) clarity and eloquence of the statements and dialogues; and (3) reflection of major areas of disagreement.

The rapidity of the process by which many government documents are printed for immediate use by Congress, other government agencies, and the public borders on the miraculous. Publications are available in a matter of a few months, weeks, or even days—three days for *The Congressional Record*—as compared with periods of nine to twelve months for commercially published books. But the costs of such speed are certain numbers of errors and occasional nonsense in the finished product. The editors have taken liberties in correcting obvious errors in syntax and meaning; where there was some possibility that the editors' changes might do some violence to the original text, inserted or changed words or phrases are enclosed in brackets. In the cast of minor and obvious errors, changes have not been indicated.

Throughout this introduction, the editors have inserted page numbers in parentheses to point to portions of the book where references to particular ideas can be found. The references are illustrative, not exhaustive. In some cases, the editors' analyses are based in part on knowledge of the complete hearings; but, for the most part, the commentaries contained in this introduction are supported by the selections contained in the book.

What Is "The Environmental Problem"?

Major problems emerge in vague, amorphous forms. They are not accompanied by do-it-yourself instructions for clarifying the issues or finding their solutions. So it is with the environmental problem. We are still wrestling with the basic issues of definition, trying to discover the boundaries of the problem, the crucial elements which compose it, and the dynamic interrelationships among those elements. As one witness pointed out, we are faced with the very difficult and frustrating task of "thinking about everything at once" (81). We have not yet found any fully satisfactory intellectual framework to use in analyzing the problem so that we can work fruitfully with it.

In a sense the entire course of the hearings represents one long attempt to define the environmental problem and clarify exactly what it is that we mean by that phrase. The witnesses based their recommendations for solutions on their own mental images, analyses, and assumptions about the dimensions and causes of the problem. A few of the witnesses addressed some of their testimony directly and overtly to the issues of definition.

Defining Terms. "Environment," "ecology," and "ecosystem" are core terms which have recently found their way into nearly everyone's vocabulary. Yet there are many different meanings attached to these words. Indeed, their usages are so imprecise that they perhaps cover up much real disagreement over the relevant issues of the environmental problem, making it appear to be a national problem on which there is wide consensus with respect to definitions and diagnoses. The terms "environment" and

*John Brademas, Indiana, Chairman; Dominick V. Daniels, New Jersey; John Dent, Pennsylvania; Patsy Mink, Hawaii; Lloyd Meeds, Washington; James H. Scheuer, New York; Joseph M. Gaydos, Pennsylvania; Adam C. Powell, New York; Ogden R. Reid, New York; Alphonzo Bell, California; William A. Steiger, Wisconsin; Earl F. Landgrebe, Indiana; Orval Hansen, Idaho.

"ecological balance" were not given specific definitions in the Act, perhaps to take advantage of the apparent consensus.

The Meaning of "Environment." One problem with the term "environment" is our tendency to view the environment as an ideal state, which, because of man's activity, is becoming less and less ideal. In this sense, man acts as a constraint or barrier to the achievement of the ideal natural state. But some witnesses suggested that we should view the man-nature relationship in just the opposite way: the environment imposes a set of constraints on man's activities. Man must work within the limits of the "laws of nature," for he is a part of nature, not apart from it (23;169). The environment is neither an ideal state toward which to work nor a competitor to be conquered, but simply a "given" with which we must cope and should cooperate.

Perhaps an even greater problem with our interpretation of the word "environment" is its comprehensiveness. "Environment" includes everything "from the skin out," according to one witness (169-170). In one sense, the breadth of the term "environment" is helpful, for it underlines the fact that we are today concerned with the complex, *total* system of the planet. In the past, national issues similar to those we now lump together under the environment heading were narrower in focus, as indicated by the labels "conservation," "wilderness," and "nature" (54-55). "Environment" refers to "man and his relationship to all living things," and includes not only the natural world—as we are often inclined to interpret it—but also the man-built world (69;159).

The "Ecosystem" Concept. Some witnesses indicated that, because of its breadth, the concept "environment" is not analytically useful. One cannot "manage" such an all-encompassing thing either intellectually or actually (169). According to one witness, "ecosystem"—which implies a much more clearly defined and limited scope—is a more useful concept for helping us to analyze environmental problems and devise workable solutions to them (170). The system concept is particularly helpful in highlighting the interdependence of man and nature. If we recognize that the elements composing a particular system are interrelated, then we must also recognize that a change in one will bring about adjustive changes in others. Hence, if man acts on one element in an ecosystem—say, by building a dam across a stream—then changes will occur in other elements of the system—the flow of water downstream will change, thus bringing about changes in vegetation, and so forth (18;22;161). [Two sources on system analysis in the social and behavioral sciences are Walter Buckley, ed., *Modern Systems Research for the Behavioral Scientist* (1968), and Alfred Kuhn, *The Study of Society: A Unified Approach* 1963).]

Ecology. "Ecology" was defined by one witness as "the study of relationships or interrelationships among living things and their environments" (19). Ecologists have attempted in the past few decades to apply the system framework to examination of the natural world. Some witnesses described the science of ecology as being as much a general attitudinal approach as a particular scientific method (18;22;33). Ecology is a holistic approach to problems, involving recognition of the interdependence of everything in nature. Thus, ecologists attempt to be comprehensive in one sense, while avoiding the vagueness of the concept "environment" by employing a powerful intellectual organizer to guide their investigations.

Unfortunately, the broad scope of traditional ecological science still leaves out at least two very significant aspects of the system of man-land relationships which are crucial to understanding and solving environmental problems—the social and the valuational elements of the system. The importance of these, particularly the valuational elements, was emphasized by nearly every witness before the subcommittee.

Defining the Problem. Many have defined the environmental problem generally as a deterioration in the quality of life on this planet. One witness described it as the destruction of "the ability of the earth to support life," regardless of quality (20).

Though such definitions are useful as nutshell indicators of the issues, they do not lend themselves readily to fruitful analysis of the problem. One possible procedure for arriving at a deeper, richer, and more analytically potent definition of the environmental problem might be to list the specific examples of environmental problems cited by both experts and laymen, and then ask several key questions about that list. Congressman Brademas opened the hearings with an enumeration of several problems, including air pollution, oil spills, pesticide contamination of food, water pollution, and esthetic pollution (17). Each subsequent witness proposed other candidates which might be added to a list of our operational perceptions of the problem. Once such a listing is drawn up, one might begin to analyze the environmental problem by asking several questions about the list: "What are the similarities among these problems?" "Are there several broad categories into which they might be ordered?" "What are the interrelationships among the problems?"

Causes of the Environmental Problem

Another way to define the problem is through causal analysis. Numerous witnesses offered explanations of various possible origins of the environmental problem. Each of their explanations appears to relate to one or more of five basic causal factors: (1) excessive population growth; (2) unwise technological intervention in the natural environment; (3) inadequate knowledge of the natural and social environment; (4) dysfunctional values and attitudes; and (5) inadequate and inappropriate social structures.

Excessive Population Growth. One explanation of the causes of our environmental problems cites the population explosion and the heavy burden it places on the natural environment. As population increases, greater demands are put on the resource base by increased consumption and waste production (20). These greater demands made on the natural environment for supplying human needs have produced many of the things we today label "environmental problems": pollution, decreasing soil fertility, depletion of nonrenewable resources, and so forth. One witness claimed that many of our environmental problems today are "a direct and unavoidable consequence of a

population that already exceeds a reasonable size . . ." (36).

Some authorities do not agree with this interpretation of the relationship between resources and population, though their point of view was not brought out clearly in the hearings. They contend that because "spaceship earth" is essentially a closed system it does not lose energy and matter (resources). The problem is to find more efficient means of recycling this energy and matter to make it available for use and re-use by more people. In their view there are really no nonrenewable resources, only changes in the forms of resources. Though we may deplete our coal deposits, we do not lose that energy forever. We have simply converted it to another form and must find ways of utilizing that transformed energy. Buckminster Fuller's *Operating Manual for Spaceship Earth* is based on such a view. Frequently coupled with this interpretation is the view that population growth is not necessarily undesirable, embodied in the witticism, "The man who will solve the population problem may not have been born yet."

Unwise Technological Intervention in the Natural Environment. Several witnesses faulted the nature and extent of technological intervention in the natural environment as a major contribution to environmental problems (26;77). It was pointed out that one cannot produce the power and goods we want—our intended effects—without also producing "side effects" in the environment (144;153). Though some unanticipated consequences may be beneficial, others may be deleterious. It is the deleterious side effects produced by technological intervention which constitute environmental problems (18; 89).

Some authorities have taken issue with the idea that technology and its side effects lie at the heart of the environmental problem, though this view is not stressed in the hearings. They point out that some forms of "pollution"—such as pollen or sediment—are produced by nature, not man's interference with nature. Whether or not certain natural phenomena are defined as pollutants depends on the extent to which they interfere with man's accomplishment of desired social goals. [See J. Clarence Davies III, *The Politics of Pollution* (1970), pp. 18-19, for a concise exposition of this viewpoint.]

Incomplete Knowledge. It might seem contradictory to say that our high degree of technological development is at least partially responsible for our unhappy state, and then, in the next breath, say that the underdeveloped state of our technical knowledge is at fault. One witness stated the dilemma thus: ". . . man's ability to create adverse effects has reached the point where it occasionally exceeds his ability to perceive, judge, prevent or control them" (72). We are faced with the problem of the sorcerer's apprentice: a little knowledge is a dangerous thing.

The creation of unwanted, unanticipated side effects was attributed, by some witnesses, to the rigidity of the structures of knowledge which we have developed over the past few centuries. Knowledge is fragmented into distinct academic disciplines, reinforced by the departmental structures of universities and other research and training institutions (Appendix C;18;36-37). The blinders of academic specialization keep us from predicting and planning for any consequences—both in the social and the physical realms—which do not fall within the boundaries of our own discipline's subject matter or methodology. We tend to see problems in terms of very limited closed systems composed only of variables relevant to a single discipline or a single technical problem.

Another inadequacy in our knowledge relevant to environmental problems concerns not the level of highly technical expertise, but the general level of public understanding of natural and social systems. Without at least a minimal understanding of the technical matters involved in environmental problems, the voting public has not been able to make effective and sane judgments about the establishment of policies and programs for maintaining a quality environment (183). One witness proposed that "our environment is despoiled largely because our culture and education which reflects it have failed to develop the necessary understandings of important relationships of man in the biosphere" (66). Other witnesses suggested that the very complexity of the issues involved hinders adequate general public understanding and that the information sources which might be used to increase such understanding instead frequently divert attention or block useful and full public learning (162-63;184).

Dysfunctional Values and Attitudes. Whether we see the root of the environmental problem in population growth, technology, incomplete knowledge, or even natural phenomena, we ultimately find ourselves thrown into a discussion of values: whether the consequences of these phenomena are considered detrimental or beneficial depends on the values human beings place on them. Our values determine our goals, and our interpretation of whether an event is good or bad depends on how that event affects the achievement of our goals. Our values and attitudes guide our relationship to the natural environment.

Numerous witnesses felt that certain widely-held "ecologically unsound" values and attitudes were responsible for man's current dysfunctional relationship with the natural world. Paralleling the argument about academic fragmentation cited above, some witnesses pointed out the fragmentation of our value systems. Values relating to work and production are frequently sealed off from our sensitivity to esthetic and ethical concerns (25-26). Our social, economic, and political policies—indicators of those things which we collectively value—are limited to a narrow range of objectives (172).

Several witnesses blamed our great faith in and value placed on material growth and expansion. Today's "growth ethic," according to some witnesses, derives from our earlier "frontier values," which were based on the belief that there existed virtually unlimited space and resources in this country (22;26). We are now recognizing that the nation's resources are finite and, thus, our former attitudes of devotion to "unbridled growth and exploitation," "the almighty GNP," and "sheer quantity" have become inappropriate and counterproductive (25;41;55;88).

Most witnesses tended to see man's values and attitudes as interfering with nature, rather than nature as posing a barrier to the achievement of societal goals.

Several witnesses contrasted the ethic of "stewardship" of the earth with that labeled "human chauvinism" by one witness—the attitude that the earth was created specifically for man, the apex of being, to use for his own selfish benefit without regard to the other creatures inhabiting the world (23-24;161). Man must change his relationship with nature from a fighting posture to one of cooperation (23;55;79). There were several references to the Biblical injunction that man should "have dominion" over the earth and discussion of some of the implications of the way in which this phrase has been interpreted. The view that Judeo-Christian cultures have used this as a license to despoil the earth was sharply debated. Alternative interpretations of the meaning of "have dominion" were suggested, pointing to concepts of reverence, stewardship, and oneness (23-24;41;87;157).

A few witnesses sought to balance a proper reverence for the earth with what they felt was an equally proper reverence for the achievement of certain societal goals. "Nature chauvinism" can have ill effects on the social system, just as "human chauvinism" can be detrimental to the natural system. In cases in which improvement of the natural environment conflicts with improvement of the social environment—for instance, by threatening certain highly valued freedoms, or by imposing an undue burden on groups which are already downtrodden—we must be careful to search for a balance between these equally important values (84-85;155-56;186).

Inadequate and Inappropriate Social Structures. A few witnesses saw the roots of the environmental problem in our current social (including economic and political) structures. Through various social mechanisms we determine what things are to be valued and what things are not, whose values are to dominate and whose are to be subordinate, and which values will be given support and which will be discouraged. One witness pointed out that "all human activity produces both goods and bads. . . . Hence, unless there are elements in the structure and organization of society to correct these processes, the increased production of goods, which is what we mean by economic development, almost inevitably produces likewise an increased production of bads" (153). Another witness proposed that the current societal structures do not allocate influence, responsibility, penalties, and benefits in a way which can properly control environmental deterioration (77). Still another stressed that the focus of the problem was in the social realm and decried our tendency to blame a "malfunction of natural ecosystems" for our woes (172).

Solutions to the Environmental Problem

As with causes, many solutions to the environmental problem were suggested during the course of the hearings. Interpretations of the origins of the problem, of course, shaped suggestions for "cures." Those who saw the roots of environmental problems in excessive population growth focused their attention on ways to limit that growth; those who saw the origins in dysfunctional value systems concentrated on ways of redirecting current attitudes; and so forth.

None of the witnesses testifying made the diagnosis, "Situation hopeless; no solution possible"—though such claims have been made in this country (154). It was suggested that another approach—based on the belief that environmental problems are, in reality, merely public relations-public image problems which can be solved by effective advertising and a "good press"—ranks close to do-nothingism as a constructive problem-solving strategy (19).

Most witnesses appeared to agree that the roots of the environmental problem went much deeper than a Madison Avenue cure could reach and that, in spite of their complexity, solutions were possible. However, the specific suggestions for solutions ranged widely and frequently conflicted with one another. The greatest point of agreement among participants in the hearings was that education of one sort or another had a major role to play in solving environmental problems. This might be expected, since the bill under examination dealt with defining the role of education in this area. However, it is also indicative perhaps of what some have seen as a pervasive tendency in the United States to look upon education as a panacea.

The witnesses proposed both specific programs and general problem-solving strategies relating to each of the previously mentioned categories of causation: population, technology, knowledge, values, and social structures. Naturally—because discussion focused on the Environmental Quality Education Bill—the coverage and depth of non-educational solutions was much less than that of educational solutions. In general, it can be said that the participants in the hearings felt that education could play an important role in remedying the faults in every causal area. Education was viewed as providing at least a necessary undergirding for solutions in some categories, and as playing a direct role in solving problems in some areas. Brief sketches of some of the proposed solutions in each category follow.

Solutions Related to Population Growth. There were several discussions of the need for limitations on population growth and possible ways to accomplish this (20-21; 24-25;36;156;186). The problem of how to exert social control in this area without interfering with individual rights of religious belief and privacy was discussed by some witnesses (24;156). The burden which population control would place on groups which are already in a small minority in this country was also stressed (186). Some witnesses pointed out that our educational institutions have not in the past accomplished much in an area vitally relevant to solving population problems—sex education—and that the willingness of communities to let the schools act in this area even today is not very great (39-40;176).

Though a leveling off or reduction of population appears to offer a partial solution to environmental problems, decreased population will not automatically bring about significant betterment if the material wants of human beings continue to grow. Many witnesses emphasized changing values and attitudes related to life styles as much as controlling family size (38;80;100;166).

Solutions Related to Technology. For many who saw the root of environmental problems in our technological intervention in the natural system, the obvious solution

appeared to be to change the nature and impact of that intervention so that it would produce fewer negative consequences. Some witnesses proposed that one possible alternative would be to eliminate our complex technology entirely and return to a subsistence system (160;166). Others disputed this course of action, both in terms of feasibility and desirability. They proposed that there might be ways of improving our technology which would allow us both to meet our material wants and to protect the natural environment (79;147).

Nearly all witnesses stressed the role which educational institutions can play in helping to find and implement technological solutions. Not only are they the training grounds for technical experts, but also they can expand general public understanding of technological questions (18;33;72;88;102-103;154).

A few witnesses questioned whether the basic solutions lay in the technological realm at all. They suggested that, though technological matters are important, of greater importance are the human problems of how and why we use our technology as we do (25;43;66;89;91).

Solutions Related to Knowledge and the Structure of Knowledge. It was noted in the previous discussion of causes of the environmental problem that the incompleteness of our knowledge has contributed in major proportion to creation of undesirable environmental consequences. Both the level of general public understanding and the state of more specialized, technical knowledge were found lacking. Criticisms of the nature and extent of our knowledge refer most frequently to knowledge of natural and technological systems, but it should be remembered that knowledge of human behavior and social systems and their interfaces with the natural system is equally important for an understanding of environmental problems (34;66). There exists a tendency to view knowledge in social realms as somewhat less than truly "scientific" (33). This leads often to a concentration on how to improve the state of knowledge in the natural and physical sciences, since they are considered areas of greater potential in finding environmental solutions. But if part of the environmental problem lies in deficiences in the social realm—as so many witnesses contended—attention should also be given to whatever knowledge the behavioral and social sciences can offer and to improving the overall state of that knowledge (67).

The witnesses' suggestions for remedying the inadequacies in our knowledge dealt with such problems as refining our methods of gathering data on the state of the environment and the impact of various actions on it (185-86); developing methods of handling and processing vast amounts of data through complex modeling systems, regional and whole-earth simulations, and computer technology (81-82;150); and utilizing many different kinds of educational channels, including the mass media, to ensure that the public is informed of existing conditions and understands the implications of various proposed alternative courses of action for maintaining a quality environment (72;182). Very strong emphasis was laid on the importance of developing truly interdisciplinary approaches to learning, research, and program implementation (36-37;50;66;101;170-71;Appendix C).

Solutions Related to Values. The role of values and attitudes in bringing about our environmental problems was a theme that surfaced in nearly every witness's testimony. Some suggested that changing values, not increasing scientific understanding, should be the focus of our problem-solving efforts (25;43). Others indicated that changing values, though not a total solution, would be a necessary foundation for successful action programs applying our scientific knowledge (25;80). Some indicated that nothing less than a dramatic, radical change in such dominant values as competitiveness, materialism, and man-centeredness would be necessary, while others suggested less extensive re-orientations and adjustments (23-24;25;38;41;55;79;80-81;88;161).

How to go about effecting the needed changes was a major question, which most witnesses answered with the word "education," though some suggested legislative and other approaches. Some felt that, because many of our values are learned and reinforced in the educational process, this would be the most likely area in which to seek remedies (22-23;30). At least one witness was quite optimistic about our capabilities for accomplishing rapid changes in values in this country through our educational and communications systems (80). One witness suggested we encourage experimentation with alternative life styles as a means of changing values (91). It was suggested, too, that religion and the churches might play a significant role in re-orientating our values and attitudes (24-25;87).

Some of the testimony indicated that we do not need to *change* values so much as we need to *clarify* our valuing and decision-making processes. Environmental problems do not present us with cut-and-dried issues of "good" values versus "bad" values. They are true dilemmas involving competing positive values, as well as negative ones (74;82;149-151;153;155).

Some witnesses suggested using the principles of cost-benefit analysis to illuminate the alternatives available to us (149;153). The cost-benefit approach to decision-making is based in general on the idea that there exist a number of alternative ways of solving any particular problem. Each way entails both benefits (positively valued conditions or objects) and costs (negatively valued conditions or objects). One must weigh the costs and benefits of each course of action against those of any other. No matter which alterative is chosen, we will have to make "trade-offs," accepting some costs along with the benefits.

A central difficulty with cost-benefit analysis is the problem of measurement (149). How does one measure the value of such things as "beauty" or "justice"? One attempt to put a specific value on beauty in order to weigh it against the value of power production was made by the courts in the Storm King case, which is described on pages 110 through 113.

Solutions Related to Social Structure. A number of participants in the hearings believed that the best way to effect an impact on all other causes of environmental problems is by working through and changing the existing social structures. It is through various political, economic, and social mechanisms, institutions, and organizations that

we set collective goals, allocate resources to those goals, make collective decisions, resolve conflicts of interest among individuals and between society and the individual, implement action programs, and reinforce or discourage particular values and behaviors and their consequent impacts on the environment.

It was suggested that new or modified social structures are necessary in order to give support to some practices and remove existing supports from other, environmentally detrimental, practices (40;77;153-54;163;165-66). Most of the suggested social solutions involved some sort of governmental action, such as revision of the tax system, reallocation of funds for federal programs, new regulations and systems of enforcement, removal of legal limitations on non-profit environmental protection organizations, and zoning (40;89;146;153-54;163;165-66). However, some quasi- or non-governmental possibilities were mentioned, such as development of "counterorganizations" to perform watchdog functions on both government and big business; special education for those in leadership roles in and out of the political arena; assumption of attitudes of social responsibility by private organizations which are able to exert significant pressure on environmentally irresponsible groups; and construction of an "automatic regenerative cycle" within our educational institutions to insure that each new generation would have a high level of concern for environmental quality (77-78;142-43;153-54;171).

One particularly interesting disagreement among witnesses in this area was whether we should look to governmental intervention or depend on the action of individuals and private groups to effect change. One witness felt that federal intervention in most areas of the movement to create a quality environment would act as "poison," while another witness felt that it was unfair and unfeasible to demand that private groups take action instead of the government (142-43;166).

The Complexity of Environmental Solutions. As can be seen from the myriad suggestions for solutions, environmental problem-solving is extremely complex. Most witnesses, though they might emphasize one area over others for concentrated attention, would probably agree that ultimately changes must be made in many areas in order to clean up the present environment and maintain it in desirable future states. One witness decried the "efforts to find scapegoats, one-shot cures, and sure-shot gimmicks" as only adding to "pollution of the air" (108).

In attempting to solve environmental problems, we should not focus our attention too narrowly on any one category of solutions, or we shall only end up in the same bind that originally brought us to the current state of affairs. For instance, if we look only at the population problem and jump to the conclusion that limiting families to two children is the answer, what will this do to the future social, economic, and political structures of the country? Or, if we focus on the technological solution of limiting the production of electrical power, what groups will be deprived of energy and goods and what types of production will have to cease? Or, if we decide to place strong limitations on automobile production and use, how will this affect population distribution and employment patterns and opportunities?

Solutions to environmental problems will not come cheaply. As some witnesses pointed out, we may have to forgo many material and social benefits if we put stringent restrictions on some activities which are considered environmentally unsound. Though our attitudes and technology have been accompanied by many detrimental side effects, they have also produced social and material benefits which we must weigh against these side effects (146-47;153;155). Also, we must look not only at how much specific solutions will cost us in material terms, but also at what will be the costs in noneconomic terms and nonenvironmental areas and who will be asked to pay them (77;155-56). It was pointed out that we need programs to "promote environmental quality"—a collective good—"and at the same time plan for and protect various personal and political values" (72). We must find ways of combining our values for both the individual and society, today and in the future (80). If we do not take the full complexities of both the social *and* the natural world into consideration, we may gain a high-quality natural environment at the cost of deterioration in in our social system (155-56;186).

The Role of Government in Finding and Implementing Environmental Solutions

A pluralistic society allows the existence of a wide diversity of individual and group values and goals as well as varied ideas about the means to realize those values and goals. At any one time, the thinking of most of the citizenry and leadership tends to be dominated by only a few of the alternatives out of the total possible range of desirable goals and means. Occasionally, a rapid shift will take place, and previously subordinate ideas will gain sufficient strength to rise up and challenge the dominant ones, perhaps given impetus by the deterioration of some aspect of life previously guided by the old, dominant values, goals, and implemental ideas.

In such instances, one of the functions of the political process is to search for new alternatives in the public domain. This search sometimes entails a re-examination of the boundaries of the public domain itself and a redefinition of the proper areas for governmental and private action and control. Ideally, the political mechanisms of the society will seek to discover the range and strength of public opinion and expertise—on both the substantive issues of the national debate and the questions of the proper role of government in resolving the issues—and to integrate them into re-oriented public policy supported by wide consensus.

The selections in this volume from the hearings before the Select Subcommittee on Education are illustrative of a portion of this process. The witnesses before the subcommittee represented a wide cross-section of viewpoints and roles concerned with education and the environment. Their testimony reflects a current challenge to existing societal values, goals, and instrumental approaches. But among the many areas of conflict there are also hints of possible areas of consensus on which to base new public policy. The proceedings give us instructive examples of

some of the problems involved in sorting out and re-ordering so many diverse approaches to coping with the problems faced by our society.

Allocations and Priorities. One of the major problems which a political system must resolve is that of determining what goals and activities will receive highest priority, second priority, and so forth. The political process must also determine how to allocate limited resources (time, personnel, energy, funds, goods, etc.) among the chosen priorities.

Most witnesses did not explicitly question the idea that governmental institutions are and should be at least one of the major forums for debate over national priorities, though there were some reservations expressed about the appropriateness of governmental bodies for implementing solutions (see next subsection). There was considerable—and sometimes heated—discussion, however, over the proper roles of the legislative and executive branches of the federal government in setting priorities and allocating funds. During the testimony of Commissioner of Education Allen, some members of the subcommittee repeatedly expressed their dismay over what appeared to them to be the Nixon administration's lack of support for, and even outright frustration of, congressional efforts in the environmental realm. They cited the threat to congressional authority posed by the re-ordering, on several occasions, of congressionally set priorities and budget allocations by civil servants in the Office of Education and Bureau of the Budget (131-34;136).

Many witnesses as well as subcommittee members questioned the present ordering of priorities and consequent allocations of resources made by both government and private groups in this country. Some pointed out that the enormous support we currently give to the military and industry—as contrasted with the comparatively small support we give to pressing social and environmental problems—is very disturbing and should be re-examined (40;92;153). The high ethical priority placed on economic and technological growth, in both the public and the private sectors, was decried by some (149;155;166).

There was some discussion of the priority which ought to be assigned to environmental problems relative to other pressing problems, such as racism, human rights, poverty, peace keeping, and urban problems (31-32;81-82;186). A number of witnesses argued that all such problems—since they deal with the quality of life, whether physical or social—are really inseparable and interdependent. Frequently, what happens in one area affects the other. Thus, all quality-of-life problems together must be given top priority (31-32;81-82;84-85;155-56;185; 186).

One witness, in support of the above view, contended that we are "rich enough in intelligence and resources to do all of these things. . . ." while another stressed the scarcity of resources and the need to choose among competing priorities (84-85;136). Some witnesses proposed that some support for current activities which are environmentally detrimental be diverted into assistance for the new environmental priorities, either through congressional reallocation of program budgets or through a system of pooling and rechanneling fines levied against polluters (40;159). Several witnesses made suggestions about the total funding and internal allocations of the budget for this particular bill (61;73;127;135-36).

Governmental Intervention: How Much? The testimony and questioning of the witnesses reflected a continuous search for the most efficacious balance between political mechanisms, other social mechanisms, and individual action in solving environmental problems. How much should federal, state, and local governments do to solve the problems? Are governmental bodies the most appropriate and effective instruments for resolving environmental problems? Should government only undertake solutions of certain kinds and in certain restricted areas, or should it carry out a massive, all-encompassing program of environmental improvement? Should government develop and execute direct action programs itself, or only offer encouragement and support to action by nongovernmental groups? This search for the proper boundaries between public and private domains provides a major theme of the hearings.

Some witnesses were concerned that governmental action, in at least some areas related to environmental problems, might not be the most effective means of "getting at" the core of the problem or that governmental intervention might even be detrimental to finding solutions. They questioned whether governmental instruments would be able to effect the "most important changes"—those needed in areas of human awareness and attitudes (26; 41). Some felt that governmental intervention in some areas, especially education, would be a definite detriment to solving environmental problems. The federal bureaucracy might block many promising change-oriented programs, and thus be a barrier to, rather than facilitator of, solutions (160-61;166-67).

One witness called for a balance between governmental endeavor and private initiative, pointing out that different approaches are appropriate for different problems (37-38). There was some debate over specifically which problem areas should be designated for which kinds of action. Some were worried about governmental interference with communications and the media (38;182-83), while others recommended government regulation in this area to restrain the spreading of misinformation by polluters and give support to groups attempting to counter such information (38;165-66;185). Some felt that government should become actively involved in the task of breaking down old, outdated institutions and supporting the development of completely new alternatives to those institutions (89;90).

One interesting debate focused on the issue of governmental regulation of polluters versus private "pressuring" of polluters by nongovernmental groups. This question arose during discussion of university investment policies. It was argued that we could not expect or ask that private groups in competitive situations apply pressure on their own by withdrawing investment funds from polluting corporations. Rather, the government should make across-the-board rules under which all must operate alike (142-43). The question of governmental versus private con-

trols arose a second time in a discussion about regulation of public utility companies' advertising (145).

A number of witnesses offered suggestions for guarding against the perceived dangers of federal intervention in environmental education. Some suggested delineating clearer guidelines within the bill about the types of programs which should and should not be funded (40;172;175;178;179). Some suggested modifying the normally long and involved U.S. Office of Education application procedures. New and creative groups which are not experienced with or tooled up for filing extensive applications might then have a better chance of obtaining support for experimental programs (175;179-180). At least one witness suggested that the bill should not be administered by the Office of Education—that would only be "plugging it into a whole system which does not function." It should instead be placed under the jurisdiction of the president's Environmental Quality Council (45). Much attention was focused on the composition of the advisory committee which would oversee the administration of the Act. It was felt that the composition and role of the advisory committee would be crucial to the success, or failure, of the program. Various recommendations were made about the most effective size, age distribution, and combination of environmental education expertise for the committee (19;40;42;62;72;78;103-104; 104-105;125-26;159;173).

There was some discussion also about the appropriate levels of government to handle problems of environmental education and quality. Some felt that the majority of environmental decisions were, in actuality, made at the local and regional level, and therefore, concentration should be on governmental programs at this level; while others felt that eventually coordination and planning would have to be done at the national level (97;146). A number of witnesses argued that there were too many areas where nothing would happen if the federal government did not take the initiative in funding and conducting programs (62;63;139-40;159). Others expressed faith in the states and localities, suggesting that the bill ought to provide for a greater role by the states and aim eventually at turning programs and funding over completely to state and local responsibility (59-60;118;119).

Education as a Solution to Environmental Problems

The testimony and discussion during the hearings, of course, focused most heavily on the role education could play in solving environmental problems. Attention was concentrated primarily on the goals of environmental education and how best to achieve them. Occasionally, discussion touched on the question of the relative effectiveness of education as a vehicle for solving environmental problems as opposed to other societal institutions and mechanisms. But, for the most part, the hearings participants seemed to assume without question that some sort of education—whether within the traditional institutions or through new channels—would be a necessary and integral part of solving the nation's environmental difficulties.

There does appear to be substantial basis in the previously described causal analyses for believing that education can play an important role in restoring environmental quality. Overall, the witnesses saw education as providing an ongoing and widespread undergirding of understanding and support for environmental improvement programs. The roles of education in spreading and creating knowledge and in influencing values and attitudes were considered vital to any overall effort to improve and maintain environmental quality in this country.

Among the major educational issues discussed were the current "state of the art" of environmental education; the purpose and content of environmental education; who should be the main target groups of the environmental education effort; and what are the best channels for carrying out such efforts.

Current Status of Environmental Education. One of the most remarkable aspects of these hearings was the nearly total agreement with the basic assumption of the Environmental Education Act—that environmental education in this country is extremely underdeveloped and in need of strong and concerted action to correct its weaknesses. Only a few witnesses doubted the need for any such act at all (132;166).

Witnesses cited inadequacies in educational materials, teacher preparation, and overall organization of educational institutions. The existing materials which might be used in environmental education programs were considered inadequate in number, variety, content, and approach (53;56;66;115;117). Nor is there any good way to find out what materials do exist and how effective they are (61;118;133). One witness pointed out that frequently, when good curriculum ideas and approaches in environmental education do exist, they are not in written form and are therefore not easily disseminated throughout the country so that others may use and evaluate them (177-78).

Several witnesses criticized current teacher training programs for failing to provide the breadth of background and holistic approach to problem-solving necessary for environmental education (90;178) The need for improved teacher training, both preservice and inservice, was viewed by some as being at least as important as materials development, evaluation, and dissemination; and some even considerd the development of good materials a waste if the teachers who use them are not concerned and informed (42;115;160).

Several witnesses felt that improved teacher training and materials development must go hand-in-hand with general reform and reorganization of the schools. Much of what is currently called "environmental education"—or any other kind of education, for that matter—does not encourage growth and exploration, but rather "contains" the learner within the classroom, within the boundaries of acadamic specialties, within rigid bureaucratic structures, and within lockstep curricula (39;66;120). The current interest in and support of a holistic, exploratory kind of environmental education program could provide a fertile opportunity for much-needed overall reform of the ways in which we organize educational experiences (39; 66).

Though there was wide agreement on the need for upgrading environmental education, this area of the curriculum was not by any means seen as a vast desert. Wit-

nesses described a number of existing programs and some well-developed, though not yet implemented, models as well. Descriptions of a number of elementary and secondary school programs, materials, and models may be found on pages 30,31,66-67,115-16and131-32, and in Appendices D and E of this book. Several university and university-based programs and models are described on pages 49-51 and 54-56, as well as in Appendix C. Information on programs in other countries may be found on pages 58, 62 and 102. Various kinds of programs, materials, and models developed by nonschool groups are mentioned on pages 69-70,78-79,85,97-98,122-24,157-58,163-64, 182-83,185and186. A proposed National Center for Environmental Studies, to coordinate and maintain improvement in environmental education nationwide, is described on page 119. Thus it appears there does exist a base of materials, programs, and models from which to work in developing high quality environmental education in this country.

Purpose and Content of Environmental Education. A composite of the suggestions from all the witnesses about what environmental education should attempt to accomplish and what it should emphasize gives us a variegated, multi-purpose, "total" curriculum. First, environmental education should be designed to increase the level of knowledge of the general citizenry about natural and social systems and the interfaces between them (41; 56; 66;67;88;122;144;149;154). It should also increase the breadth and depth of technical expertise on natural and social systems and on the interfaces between them (31; 33;83). It should promote a holistic, rather than specialized, approach to learning and problem solving (18;49; 54-55;56;66;69;88;100;139;170;172;174). It should increase our inclination and ability to predict consequences and make sound choices among alternative courses of action *before* taking them (18;74;147-48;149. It should encourage development of the "real world" coping skills necessary to bringing about changes in society and technology (55;66;97;117;174;186). It should promote examination and re-orientation of individual and collective values which contribute to dysfunctional man-environment relationships (31;41-42;44;80;88;100;123;148;161). And finally, environmental education, to be effective, not only should be *about* the environment—both social and natural —but also should take place *in* the environment being studied (30;120).

Target Groups. One recurring question put to many of the witnesses dealt with who should receive the most immediate educational attention. Though a few witnesses urged a comprehensive attempt to educate all possible target groups at once (55;122;144), most advocated giving priority to one or a few groups, such as teachers, voters, pre-schoolers, technical specialists, city dwellers, undergraduates in colleges and universities, or elementary and secondary pupils. It was frequently pointed out that, because of limited funds, one bill could not undertake to re-educate the entire American public at once. Some ordering of priorities with regard to target groups would have to be made.

Many witnesses urged that the most immediate focus should be on pre-school children, for it is in these early years that fundamental attitudes and intellectual frameworks are developed (63;69;124-25;178). Some emphasized general public education through elementary and secondary school programs or at the undergraduate level (31;51-53;56;74-75;77-78;108;126-27). Others encouraged an initial emphasis on adult education outside normal educational channels, pointing out that we cannot afford to wait for a whole generation of environmentally-educated youngsters to go through the schools (40;126;158). The training of teachers, who would then carry on the education of youngsters, was stressed by a few witnesses (56; 116). Some suggested that policy-makers, community leaders, and leaders of government and industry, rather than the general public, should receive the greatest educational attention first (55;171;174). Though the bill was not designed to encompass graduate training of environmental specialists, several of the witnesses advocated greater attention be given to such training (18-19;69-70;72). A number of witnesses expressed concern over an apparent overemphasis on wilderness and rural environments. They urged that prior attention be given to educating city dwellers, and particularly those living in ghettos, about the very direct relevance of environmental understanding to their own problems (35;75;108;125;185).

Educational Channels. Another major thread of questioning dealt with the channels or vehicles for educating the nation environmentally. What are the most appropriate and effective channels for transferring environmental understanding from its sources to particular target audiences? The overall thrust of the testimony was to "get everyone into the act." Many witnesses recommended using all available communication and educational channels to reach as wide an audience as possible (24;30;39;128;136-37;182). The list of possible vehicles is lengthy: churches (24;87), student groups (37;40;43;172), citizen groups and professional organizations (30;39;69-70;72;78;98; 136-37;163;172;175;186), and many other types of organizations, as well as the traditional, formal educational channels.

At least one witness expressed a cautionary note, warning against including absolutely everyone in the eligibility list for funds. He felt that it would be dangerous not to make explicit some criteria of qualification, giving money only to groups with previous involvement and commitment to interdisciplinary, environmentally oriented education (172). There was some controversy over whether universities are capable of contributing adequately or usefully to improving environmental education at the precollegiate level, since they are so isolated from the problems encountered at this level and they display a strongly ingrained tendency toward academic specialization (52-53; 68;90;120;172).

A number of witnesses expressed reservations about concentrating too much of our efforts on established institutions, and urged that the bill extend aid far beyond the traditional channels of education (39;45;78;82;86; 128;136-37;160;186). Two witnesses stressed the necessity of coupling educational efforts with direct action programs for coping with environmental and other problems (75;186). Some were worried about the effects of any governmental intervention in the area of environmental

education. They feared that many much-needed radical programs might suffer premature deaths at the hands of governmental officials who perceived them as threats to the established social, political, and economic system (160-61;166).

The Hearings as an Educational Resource

There are many more threads of discussion which might be drawn out of the testimony and questions which might be asked about the hearings: What differing assumptions do the hearings participants make about the nature of change, particularly social change? How do these shape their approaches to solving environmental problems? What major viewpoints and ideas are not broached? Were some viewpoints given undue attention at the expense of others? Did the testimony have any apparent effect on the legislation? Just how significant an influence on the policy-making process has the upsurge of public environmental concern been?

The hearings of the House Subcommittee on Education on the Environmental Education Act of 1970 provide a rich picture of the depth and breadth of one current national debate. Much can be learned from studying the record of the hearings about not only the specific substantive issues involved in the debate, but also the difficulties encountered in resolving any national problem.

The selections of testimony in this book can serve not only as a reading resource, but also as the basis for a variety of participative classroom and study group activities. The questions and issues discussed above can, of course, provide focal points for group discussions. Several manageable problem-solving exercises are suggested by the testimony. For instance, students might do a cost-benefit analysis to determine whether paper cartons or glass bottles is the more environmentally sound form of packaging milk. Some learners might be interested in drawing up alternative budgets for the act to compare with those proposed in the hearings; or they might want to look into a comparison of military and educational funding. A class or study group might be divided into several role-playing teams, one of which ("the U.S. Office of Education") would develop written guidelines enumerating specific criteria for selection of programs to be funded. The other teams, using these guidelines, would draw up proposals for programs, which would then be reviewed and accepted or rejected by the "Office of Education." There are many opportunities for developing role-playing debates based on portions of the hearings. Commissioner Allen's exchanges with the subcommittee members provide especially exciting material for this kind of activity. Finally, students and study group members might like to try their hands at devising their own environmental education programs for their school or community and then developing strategies for actually implementing those programs. In so doing, they will encounter, through their own experience, many of the issues and problems raised by participants in the hearings.

SELECTIONS FROM HEARINGS

ON THE ENVIRONMENTAL EDUCATION ACT OF 1970

DAY 1

House of Representatives, Select Subcommittee on Education
Washington, D.C.

Tuesday, March 24, 1970

The opening morning of the hearings on the Environmental Education Act was indicative of the entire course of the hearings. The witnesses represented a variety of backgrounds and gave excellent, provocative testimony. Many issues were raised, touching on diverse facets of life and our environment.

The subcommittee heard from an ecologist, a theologian, and an artist. Each witness dealt with a number of topics that were to be raised many times throughout the hearings. LaMont Cole described the ecologist's holistic approach to the study of natural systems, stressed the urgent need for trained ecologists, and pointed out some of the barriers to interdisciplinary work on environmental problems. He emphasized the influence of population and standards of living on environmental problems.

Joseph Sittler focused on several facets of the relationship of religion and values to environmental problems. He described the development of "frontier values" in the United States, discussed the ramifications of the Christian interpretation of man's "dominion" over the earth, and examined problems of population policy in the light of Christian values.

Robert Motherwell also emphasized values—primarily artistic and aesthetic—pointing out that our lives and value systems have been split into tight compartments of work and pleasure. He painted a verbal picture of technology run wild, uncontrolled by aesthetic sensitivity. He described how the artist can play a role in solving environmental problems by acting as a gadfly, reminding us of the aesthetic needs of the human spirit.

Though each witness presented a unique viewpoint, all broached two subjects which were to continue as major themes throughout subsequent sessions. One theme was the fragmentation of knowledge and values into specialized, disconnected vocations and disciplines, and the resulting urgent need for an integrated, holistic approach to environmental problems. The other was a concern for a better balance between materialistic goals of growth and economic progress, on the one hand, and the maintenance of aesthetic, psychic, and ecological harmony on the other.

The subcommittee met at 9:30 a.m., pursuant to call, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronold C. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

[*At this point, the text of the bill under consideration was read into the Hearings. Portions of the bill are reproduced in the lefthand column below. Corresponding portions of the act, as it was passed on October 30, 1970, are shown in the righthand column. The excerpts from the bill and the act are arranged to facilitate a comparison of the two documents. Complete texts of the bill and the act may be found in Appendices A and B.*]

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H.R. 14753
91st Congress, first session

A BILL

To authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Environmental Quality Education Act".

STATEMENTS OF FINDINGS AND PURPOSE

Sec. 2. (a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance

is in part due to poor understanding by citizens of the Nation's environment and of the need for ecological balance; that presently there do not exist adequate resources for educating citizens in these areas, and ~~that~~ concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this Act to encourage and support the development of new and improved curriculums to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curriculums in model educational programs and to evaluate the effectiveness thereof;

to disseminate curricular materials and information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community, and industrial business leaders and employees, and government employees at State, Federal, and local levels;

to provide for community education programs on preserving and enhancing the environmental quality and maintaining ecological balance;

. . .

Sec. 5. (a) The Secretary of Health, Education, and Welfare shall appoint an Advisory Committee on Environmental Quality Education. . .

(b) The Advisory Committee on Environmental Quality Education shall be appointed by the Secretary without regard to the civil service laws and shall consist of twenty-one members.

Public Law 91-516
91st Congress, H. R. 18260
October 30, 1970

AN ACT (84 Stat. 1312)

To authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Environmental Education Act".

STATEMENTS OF FINDINGS AND PURPOSE

Sec. 2. (a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance **poses a serious threat to the strength and vitality of the people of the Nation and** is in part due to poor understanding by citizens of the Nation's environment and of the need for ecological balance; that presently there do not exist adequate resources for educating **and informing** citizens in these areas, and that concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this Act to encourage and support the development of new and improved curricula to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curricula in model educational programs and to evaluate the effectiveness thereof; **to provide support for the initiation and maintenance of programs in environmental education at the elementary and secondary levels;** to disseminate curricular materials and **other** information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community, **labor,** and industrial **and** business leaders and employees, and government employees at State, Federal, and local levels; **to provide for the planning of outdoor ecological study centers;** to provide for community education programs on preserving and enhancing the environmental quality and maintaining ecological balance; **and to provide for the preparation and distribution of materials by mass media in dealing with the environment and ecology.**

The Secretary shall appoint one member as Chairman. The Council shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology. The Committee shall meet at the call of the Chairman or of the Secretary.

Sec. 7. There is authorized to be appropriated for carrying out the purposes of this Act such sums as Congress may deem necessary.

. . .

Sec. 3. (c) (1) There is hereby established an Advisory Council on Environmental Education consisting of twenty-one members appointed by the Secretary. The Secretary shall appoint one member as Chairman. The Council shall consist of persons

appointed from the public and private sector with due regard to their fitness, knowledge, and experience in matters of, but not limited to, academic, scientific, medical, legal, resource conservation and production, urban and regional planning, and information media activities as they relate to our society and affect our environment, and shall give due consideration to geographical representation in the appointment of such members: *Provided, however,* **That the Council shall consist of not less than three ecologists and three students.**

Sec. 7. There is authorized to be appropriated **$5,000,000** for the fiscal year ending June 30, 1971, **$15,000,000 for the fiscal year ending June 30, 1972, and $25,000,000 for the fiscal year ending June 30, 1973,** for carrying out the purposes of this Act.

APPROVED OCTOBER 30, 1970.

The Environmental Quality Problem

Mr. Brademas. The subcommittee will come to order.

The Select Subcommittee on Education today opens the hearings on H.R. 14753, the Environmental Quality Education Act, which, on November 12, 1969, I introduced along with the gentlemen from New York, Mr. Scheuer and Mr. Reid, and the gentleman from Idaho, Mr. Hansen. The bill now enjoys the cosponsorship of some 80 members of the House of Representatives of both parties.

Members of Congress, I am sure, must all be struck with the really phenomenal growth and awareness in our own country and others to the dangers of the quality of our environment. I cite only a few examples:

First, the recent issues of major national magazines such as *Forum, Time, Life, Newsweek* have been devoted primarily to ecological questions. Second, legal actions have recently been filed by the attorney general of Illinois against major corporations which have been dumping pollutants in waters around Chicago. Further, only last week the Department of Justice obtained a grand jury indictment against United States Steel for dumping solid wastes into Lake Michigan.

Third, there has been an extraordinary growth of ecology action groups among students on college campuses. Thousands of students at colleges and high schools all over the country are scheduled to participate in a nationwide Environmental Teach-in on April 22 which is designed to alert citizens of the nature of our environment. You may recall that the opening Teach-in took place last week at the University of Michigan at Ann Arbor.

Fourth, President Nixon's message of February 11, 1970, on environment, in which the president calls for expenditure of $4 billion in federal funds over the next five years on, among other items, uniform federal standards for water purity, treatment plants, and development of pollution-free automobiles.

The signs of environmental decay are obvious everywhere. Oil from faulty drillings fouls our beaches and endangers marine life and waterfowl. Pollution of the air takes minutes from each of our lives. Human and industrial waste soils our streams and rivers. Poisonous pesticides and fertilizers contaminate our food. Messy industrial areas, unsightly junkyards, ugly billboards, and thickets of power lines diminish the joy of what we would otherwise see.

To clean up our environment and to restore it to a congenial state will require billions of dollars in federal funds and money from other sources as well, public and private.

But in the view of the sponsors of the bill under consideration today, to achieve this goal we will also need a major educational effort to acquaint our younger students and adult citizens with the ecological facts of life so that future generations will not be faced with the problems that we are only beginning to confront now.

I might note here the following statement from the report which the Citizens Advisory Committee on Environmental Quality made to the president in August 1969:

> Man's interaction with his environment, both natural and man-produced, is the basis of all learning—the very origin and substance of education. Yet, our formal education system has done little to produce an informed citizenry, sensitive to environmental problems and prepared and motivated to work toward their solution.

The bill we are today considering is directed to the task of making Americans more aware of the dangers to their environment and to the steps we must take to meet them. . . .

Introduction of LaMont Cole, Professor of Ecology, Cornell University

We are very pleased to welcome as our opening witness on this legislation Dr. LaMont Cole, professor of ecology at Cornell University.

Dr. Cole, would you please come forward, and we look forward to hearing from you, sir. . . . I think it would be helpful if you would give us just a few brief comments on your background for edification of the members.

Mr. Cole. I received a bachelor's degree in physics in 1938 at the University of Chicago, and a master's degree in biology in 1940 at the University of Utah, Ph.D. in zoology at the University of Chicago in 1944, and last summer the University of Vermont awarded me an Sc.D.

I have been at Cornell since the fall of 1948, teaching ecology. I served on numerous committees of the Ecological Society and numerous advisory committees to various government agencies—ONR, NIH, NSF, and so forth. I served five years on the Advisory Committee for Environmental Biology of NSF. I served five years as editor of *Ecology* and two years ago I was president of the Ecological Society of America, and I just retired in January as president of the American Institute of Biological Sciences.

I am now serving on the American Biology Council, which is an eight-man group put together by the two largest groups of professional biologists in an attempt to have a body that can speak with one voice for all biologists.

Mr. Brademas. You have a splendid background, and clearly we picked the right man to open these hearings.

The Meaning of Ecology

Mr. Cole. Well, in your letter, you also said that there was hope I could give the principles of ecology, while keeping my total statement down to around 15 minutes. Now, this is a pretty large order, but I think to pick out one distinctive thing about ecology is the point of view that we try to take a holistic approach to problems, to realize that the plants, animals, micro-organisms, and nonliving features of the environment all form one integrated system, and when you impinge, put a pressure on this system, all of these things are changed.

For example, the average engineer looks on a salt marsh as a piece of wasteland, a nice place to build jet strips or resort hotels or something of the sort. A good many citizens look at the salt marsh as a nuisance, a rearing place for mosquitoes that ought to be bathed with pesticides.

The ecologist recognizes that salt marshes are highly productive of life. In Georgia we have actual figures showing they are three or four times as productive as the best agricultural land in the state. The organic matter produced is the source of nutrients for the coastal regions and estuaries, serving as spawning grounds for most of the marine commercial and sport fish, and which serve as nurseries for our oysters and crabs and lobsters and shrimp.

So when you put a new stress on a salt marsh, you are endangering, making changes in, the whole marine seafood industry. This system ought to be looked at as a whole so that you can predict the so-called side effects before you apply your technology and then see these strange things happen.

Now, I could give you a great many more examples. We have had numerous examples where pesticides were used to control a pest and instead made the pest more abundant because the pesticides knocked out its natural enemies. We have many other cases where pesticides had been used to control a pest and had succeeded in doing so, only to have some other species emerge as a pest. So, frequently we have created new pest species by some of these control measures.

The Demand for Ecologists

Now the public is becoming aware of these things; people are concerned, and they are asking the ecologists for advice on these things, and a lot of rather strange people are beginning to call themselves "ecologists," I might add. There are not enough ecologists to go around. We have anticipated this for some time. We knew that the public would discover us someday and want ecological advice and there would be the embarrassment of not having enough trained people.

Several years ago in the Ecological Society we did a survey of the manpower situation. The National Registry of Scientific and Technical Personnel lists 1,354 persons who class themselves as primarily ecologists. This is an underestimate, I would guess, by as much as 50 percent of the true number, because many people that we recognize as ecologists and that were active in the Ecological Society would list their first specialty as oceanography or limnology or something of that sort even though they might be, in a sense, in a branch of ecology.

Mr. Brademas. What is the second of those?

Mr. Cole. Limnology, the study of fresh water.

We sent a questionnaire around to a large number of schools that are actively training ecologists to find out how many people they were training, and here we used a very broad definition of "an ecologist" as somebody that would be qualified to collaborate on ecological research even though not qualified to teach ecology per se.

This questionnaire showed that at that time there were 2,572 students of ecology training for the Ph.D. in the United States. So if about a quarter of these represent final-year Ph.D. students, our estimate is that from 600 to 700 new professional ecologists are being produced each year.

This is not nearly adequate. My desk is covered with letters wanting recommendations for people as new schools start programs. I could easily place 15 Ph.D.'s a year if I could train them. There are not enough places training ecologists. The applications are coming into schools that are known. We are simply swamped and we probably have as many as 50 applications for every student we can admit. A similar situation exists at Yale, and I suppose it is quite common in the schools that are better known as producers of ecologists.

So there are many jobs going begging and sometimes getting filled by people who are only peripherally ecological. There is even a letter on my desk from a far-sighted community on Long Island that wishes to hire a municipal ecologist. So we are seeing new trends in interests of this sort.

Mr. Brademas. Do I take it, then, Dr. Cole, you would be sympathetic to the recommendations contained in the report to the president's Environmental Quality Council in September, last year, on the Universities and Environmental Quality, which proposes establishment of some 20 new schools of ecology at American universities?

Mr. Cole. Absolutely. It is badly needed, and the difficulty is going to be in staffing them. Anything like this present bill that calls for increasing education in ecology has my enthusiastic support. I think it is highly essential.

The Need for Professional Ecologists

I would like to say, though, there is one thing . . . that alarms me a bit. . . . [T]his is that so many people are now starting to call themselves "ecologists." I doubt that you realize how far this has gone. For example, at Cornell, the College of Home Economics recently changed its name to College of Human Ecology because this is now a good word.

Mr. Scheuer. There ought to be a law against that sort of thing.

. . .

Mr. Cole. . . . I wrote on July 17, 1968, a letter to Congressman Emilio Daddario in connection with the joint House-Senate colloquium to discuss national policy for the environment. . . . [It says in part:]

> First, underlying all of the problems of environmental deterioration is the problem of population growth. If the population is going to continue to grow indefinitely, the environment will continue to deteriorate and the ability to support life will eventually be destroyed. If the capacity to generate electricity by means that are feasible today continues to grow, we shall be finding ourselves writing off one body of water after another until none remains and we shall change our climate through thermal pollution of the atmosphere. Without population regulation, disaster is inevitable; therefore, I think it should be spelled out that any council of advisers on environmental problems must include demographic competence of the highest order.
>
> The second area I wish to mention is ecology itself. Ecologists have become fairly accustomed to seeing one committee after another set up to deal with ecological problems without including a single ecologist. Many of the traditional scientific organizations are so ignorant in the field that it never occurs to them that ecologists might know something not immediately apparent to the chemist or engineer.
>
> Any such council will also need competence in chemistry, engineering, geology, meteorology, sociology, and economics. While a few rare individuals can be found who are competent in two or three of the areas mentioned, it seems to me certain that the three-man council envisioned by at least one of the bills is too small.

The president's Scientific Advisory Council has never had an ecologist on it. They have a 16-man part-time panel of advisers on the environment, and only one of those 16 men, to my knowledge, can be said to have any knowledge of ecology.

The president, of course, set up this Environmental Quality Council, a Cabinet body, and it, of course, includes no ecologists, but they have a council of advisers, a Citizens Advisory Committee of 12 men, with no ecologist.

So this is the sort of thing that we can anticipate going on indefinitely. They just don't know who the ecologists are.

When Mr. [Representative John] Dingell's bill finally went through and became law, the result was that we now have a three-man Council on Environmental Quality, including no ecologist.

Now, I don't want this to be interpreted as in any way criticizing the three distinguished gentlemen appointed to that Council, but it impresses me as a little bit like setting up a council of economic advisers without including any economists.

I am afraid that large segments of both government and industry still view the problems of environmental deterioration as in large part a public relations problem. The newspapers just recently announced that DuPont has set up an environmental quality committee chaired by a vice president and it consists of one man each from their engineering department, legal department, and their public relations department.

Now, I think, as far as formal statements go, that that is all I will try to say. I would be very happy to try to answer any questions.

Mr. Brademas. Thank you very much, Dr. Cole. I have a lot of questions for you. Let me begin by reiterating the question I put to you a moment ago with respect to which you did provide some response, but if you were asked to give a definition of "ecology," what would it be?

Mr. Cole. Well, "ecology" is formally defined as the study of the relationships or interrelationships among living things and their environments. So people that have had formal training in any part of this general broad area I would say might be considered as ecologists. It is very much a point of view.

Mr. Brademas. So a man could be, like you, a physicist but, because of the particular perspective he takes to the subject matter in the relationship of living things, could be defined as an ecologist?

Mr. Cole. Yes. . . .

Mr. Brademas. Why would you imagine there is no ecologist who is a member of the Citizens Advisory Committee to the president's Environmental Quality Council?

Mr. Cole. I have no idea whatsoever. It must be that they don't recognize the need for one.

Mr. Brademas. I would hope that it would not be the same reason you have suggested—a number of industries are now beginning to have their vice presidents for public relations take over that particular assignment.

Mr. Cole. I hope not, too; but I just don't know.

The Growth of Environmental Concern

Mr. Brademas. Dr. Cole, *Time* magazine a few weeks ago described you as a charter member of the doomsday school of ecologists and then went on to say that despite your old pessimism, you have been somewhat encouraged over the last several years. Could you tell us why they called you that, and, second, if that was not inaccurate, what has lightened the burden on your spirit at this point in time?

Mr. Cole. Well, the course we are on is going to destroy the ability of the earth to support life. We are on a collision course with disaster in many ways. But I have been screaming with agony about it for 21 years. My first dispirited publication on the population problem was written 21 years ago, so the thing that has me encouraged now is the tremendous upsurge of interest in the subject.

Even five or six years ago, when we started sending little delegations around from the Ecological Society to talk to members of Congress individually, we found they were friendly and everything but they mostly listened just politely. Now they are calling up to see if I won't testify at this or that hearing, they are asking for statements on this and that, and they are requesting my advice on bills, even help on the wording of some of them, and so forth.

The few of us that the public does recognize are simply swamped; I can't even get my mail open a good share of the time, much less read and answer it.

. . .

Mr. Brademas. Dr. Cole, I have several other questions, but I think I will yield to the gentleman from New York, Mr. Scheuer, who has long had a very deep interest in this whole field of environmental problems, as you may know, and who participated in the UNESCO Conference in San Francisco some weeks ago and is a cosponsor of this measure. Mr. Scheuer of New York.

Mr. Scheuer. Thank you, Mr. Chairman. I certainly want to thank you for the strong support that you have given those of us who have been deeply interested in this problem, Dr. Cole. I share the fears of some that the current interest in ecology and environment may be a fad that is looked upon by many as a public relations gimmick and that we are applying bandaids and cosmetics where basic surgery and some restructuring of our basic institutions is much more relevant.

Pollution and Standards of Living

Let me read a quote from the *New York Times* of March 17: "Senator Muskie and two scholars agreed that Americans may have to hold down their standard of living to hold down pollution. They cited fast automobiles, supersonic transports, disposable bottles, and more electric powerplants as some of the things they may have to give up to help save the environment.

"Mr. Muskie said: 'In a consumer-oriented society, everything we produce leads to waste. Maybe we ought to set some limits on the standards of living'."

Now, just to take electric power, people, who are far more expert in this are than I, feel there is no way that we can produce electric power either through fossil fuels or atomic energy that does not have some fallout in affecting the environment.

Probably as hopeful an answer as any to the problems of environmental pollution is de-emphasizing additional use of electric power for hair driers, electric carving knives, and so forth.

I don't want to put words in your mouth, but do you feel that one of the benefits of an education program in our schools on environmental issues is that it may give the future citizens and the future voters of our community enough understanding of the dire effects of current practices in the production of both goods and services that cause pollution, may give them the understanding by legislation as well as by individual conduct that we have to change the basic ways of producing and consuming things?

Mr. Cole. I would agree entirely with that. This education is sorely needed. Now, I don't quite agree that it may be necessary to cut back the standard of living. It should again be looked at as a system. This country, this earth, can support a population of people indefinitely at just about any standard of living that you want to set up, but it can't do it for this large a population. Well, this is the key to the whole thing. Instead of giving up all of these things that are considered to make a high standard of living, let us see how large a population we can support without the environment deteriorating and still maintaining the standard of living we want.

This is a very multidisciplinary question, because it is apt to involve not only ecologists and demographers but sociologists and a lot of other people. We can still have automobiles with internal combustion engines without using fossil fuels. We can run them on alcohol that is grown as a crop. I don't know that we can run as many automobiles as we are running. We don't have to have these automobile graveyards. I think if Congress would repeal the depletion allowance for mining, that those graveyards would start disappearing if it became as expensive to mine new metal as it is to reclaim the used metal.

The Population Problem

So people do need to become aware and concerned about this and understand that it is this population explosion that is at the very heart of the thing. . . . [W]hen people say to me, "This population is, or the United States is, not overpopulated; we have lots of space," the answer is that perhaps our population explosion is the most serious one in the world. . . . [W]hile other countries are growing much more rapidly, in terms of the resources they are going to consume and wastes they are going to produce, one American is equivalent to about 80 Indians, so this affluent society of ours with still a growing population is a terribly serious thing which I am trying to get across to the people, but I am sure a program in the secondary and elementary schools, if you started there, would make this go much more rapidly.

Mr. Scheuer. How do you feel we ought to devise a national population policy or program? What is our maximum level of population or what is the maximum rate of population growth?

Mr. Cole. The population in this country now is estimated at 204 million, and it is growing at one percent per

year at the present time. The number that could be supported I don't know, and I wish I did know, but we can't seem to inspire these people to get together from all of the various disciplines, and particularly the economists, who usually can't conceive of a steady state economy, and to try to [work out this problem].

Mr. Scheuer. Do you feel we ought to have a zero rate of population growth in this country?

Mr. Cole. I suspect that it ought to be negative for a while, that we are larger than we can support indefinitely now. I recently put forth my views on the strategy for achieving population control in this country. I did this in a group of demographers who were not sure it would work, but they didn't shoot me down hard on it anyway. Would you like me to go into it?

Mr. Scheuer. Yes.

Methods of Population Control

Mr. Cole. First, of course, I would completely abolish any tax incentives for having large families at least beyond the second child. I would make all of the contraceptive advice and equipment available free for everyone. This is important because the moment you start discriminating, saying this is for the poor, somebody is going to charge you with attempted genocide and this can be used for political purposes, so this ought to be across the board and preferably without cost.

Mr. Scheuer. I have been active in the field of population and have cosponsored, along with Congressman Brademas, a bill that Senator Tydings is going forward with on the Senate side for complete reorganization of the family planning programs; I have come across this cry of genocide but I never heard a woman use that phrase, never heard a woman in the childbearing years who needed family planning advice and equipment to preserve her options. I have never heard such a woman expressing the view that giving her options constitutes genocide. Excuse me; I didn't mean to interrupt.

Mr. Brademas. If the gentleman will yield, what he said reminds me of a conversation I had in Huila, Colombia, a few years ago at the first pan-American assembly on population problems with the former president of Colombia, Dr. Camago, who had been President and was thinking about running again. He made a speech opening or keynoting this assembly which was in a very conservative Catholic part of Colombia, and he concluded his speech by saying, "We need birth control, and the only economic answer or political answer, the only Christian answer is birth control, and the sooner, the better." It was quite a revolutionary statement for him to have made and I asked him at the reception following; "Mr. President, do you plan to run again?" And he said, "After that speech, I doubt if I would have much of a chance," but he added—and this is what Mr. Scheuer's statement reminded me of —"I would get the women's vote."

Mr. Cole. Next I would make legalized abortion available.

With better methods, the Europeans are way ahead of us. I saw an account of one series of 20,000 abortions in Europe where only two women had to be hospitalized. They had more advanced techniques and it was as simple as having a tooth filled. Singapore recently made abortion available on request for a women in a state hospital at a cost of $1.50, which is certainly nominal enough.

This would take care of the family planning part and get rid of the unwanted children, but I don't think it would solve the population problem. Taking Cornell, even among the professors a survey showed they wanted an average of something like 3.4 children.

Mr. Scheuer. I think the Gallup poll shows 40 percent of the couples in the country want four kids or more.

Mr. Cole. We can't fine people for having extra children, because the worst offenders wouldn't be able to pay, and we can't give tax incentives for having extra children, because many of them don't pay taxes anyway, so what I would propose is to give them a bonus, and just to pull a number out of the hat, give every woman aged 15 to 44 in the United States, whether rich, poor, married, unmarried, black, white, or whatever, an annual bonus of $100 for every year she does not have a child. This would furnish some of the feedback, the incentive which I think might just work.

There are 40 million women in this category in the United States. If you want to keep the population constant, two million of these women approximately should have a child each year, so we are talking about a budget item here of $3.8 billion, which, by a strange coincidence, is almost identical with the NASA budget.

Mr. Scheuer. Are you going to address yourself to the question that some people have raised, not just the matter of unwanted births but some kind of control of wanted births?

Mr. Cole. I would try to do it by this incentive method, to make them want fewer because it would be to their financial benefit to have fewer children. If that sort of system, financial incentive, does not work, then we are in trouble because you have the fact that any steps after that are going to be unpleasant to society.

Mr. Scheuer. Is anybody doing any thinking along those lines?

Mr. Cole. I am sure a lot of demographers are thinking about it, but whether any of them feel they have the definitive answer or not, I don't know.

Mr. Scheuer. I enjoyed the testimony very thoroughly.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you very much. Let me join my colleagues in welcoming you to the committee and apologize for my brief absence to present testimony at another committee this morning.

The dialog that I just heard causes me to confess that as the father of seven children I am obviously part of the problem we have been discussing and maybe have a heavier obligation to contribute to the solution.

Mr. Cole. I have a Catholic former colleague that has seven children and now he is a convert and all for legalizing abortion. It just took too long to educate him.

. . .

Content for Environmental Education

Mr. Cole. I feel it is important to try to get some ecological thinking, some of these very broad principles or

sorts of things I have mentioned here today, to the entire college population, preferably at the freshman level.

Mr. Scheuer. Don't you think that, in addition to courses on ecology and environment, it would be worth while to weave some material on ecology and environment into courses on literature, economics, history of America, so that no matter what course you take, somewhere along the line you are going to learn about environment?

Mr. Cole. It certainly would be desirable. But I can't even communicate with our economists. I have one who is a good friend and neighbor of mine, and we can't talk about these subjects, because to him continuous growth is necessary. You grow or you die. So I feel pretty frustrated.

We set up something a few years ago called Center for Environment Quality Management, and it was originally viewed as a grouping of engineers, system analysis people, with ecologists and epidemiologists and social scientists, and by the end of the year, we found that the engineers and the ecologists and the epidemiologists were communicating very well but none was communicating with the social scientists, so they are just out of the program, although we are sorry about this.

We feel very definitely that economics and things of that sort, sociology, have to be involved. But it is going to be difficult to find the right people, and I can think of only one economist in the United States that I know for a fact will go along with the notion of a nongrowing economy. I can think of only one professor of government in the United States that has a strong feeling of the way ecology ought to be brought into governmental planning.

Mr. Brademas. Is that Dr. Caldwell of my state?

Dr. Cole. Yes; the economist is Kenneth Boulding, University of Colorado.

Mr. Brademas. We hope to hear from him in our California hearings.

Mr. Hansen. Speaking of this question, if our effort to stimulate programs of environmental education are to be successful, some of the most immediate and prime targets have to be educators, those designing the courses. I have no further questions.

. . .

Mr. Brademas. . . . I know I express the views of my colleagues on the subcommittee in telling you how grateful we are for you to come and give us this most helpful testimony. Thank you, sir.

Introduction of Dr. Joseph Sittler, Theologian, University of Chicago

Mr. Brademas. The next witness is Professor Joseph Sittler of the Divinity School of the University of Chicago.

Although it may be surprising to some that we have invited a theologian to testify on this bill, it was my own feeling that it was important to establish at the outset of these hearings that when we are discussing ecology and the environment we are talking about matters that go far beyond control of pollution of land, air, and water. We are really trying to wrestle with some of the fundamental values of human life. For that reason, Dr. Sittler, we thought it would be most helpful to our thinking if we invited you, a distinguished American theologian who has, more than most others, considered the relationship between religion and the environmental crisis. So we are pleased to hear from you.

Dr. Sittler. Mr. Chairman, I feel there is a certain embarrassment in following the previous witness, because I am a father of six children and have made more than my proper contribution to the population and pollution he alluded to. But I think there are dimensions to this problem to which the disciplines in which I am involved are relevant.

I am not only a professor of theology but also have something to do with American culture courses.

It seems to me that if one wants to adjudge the relevance of this bill to the problem we all confront, one has to put it in a pretty broad context. And one of the last statements of the previous witness gave me the chance to do that.

It seems to me that unless somehow we understand our American story in another way, we really don't take the measure of the crisis in which we are involved.

The Turner Frontier Thesis

In 1901, Frederick Jackson Turner made a famous speech called "The Frontier in American History"; he was then president of the American Historical Society. He made the point that our whole American understanding of our national endeavor in this place has been dominated by the fact of virtually unlimited space in which the American space has unfolded itself. For almost 300 years of our life the unlimited American space has meant that we could give very little thought to the consequences of operating in this space according to the desires of the moment, what seemed to be the economic opportunities of the moment. We did with American space whatever the needs of the moment required.

Dr. Turner pointed out that the frontier is now closed. A national mind which continues to operate as if the virtues that conquered the frontier can also sustain a tightly, ecologically constituted, national community, is an error in historical judgment. The frontiers did evoke magnificent virtues which we must honor—independence, resoluteness, personal responsibility, family and community cooperation—and these virtues must not be given a negative judgment. But we must raise the question: Are the virtues that conquered a continent sufficient to sustain a national community? Must there not be other ways of regarding our life and looking at our future?

It seems to me that the bill proposed envisions that. We have here a bill that is not pointed to something; it is pointed to everything, because ecology, by definition, is simply the acknowledgement that everything is involved in everything.

If you pull one dangling cord of nature you begin to unravel the whole fabric.

A Generation of Beer Can Flingers

Now the question is: Is an attempt to attack that problem such as this bill represents a reasonable and intelligent

attack? In my judgment, . . . [education is] the most vulnerable place to attack the problem. . . . [T]his bill aims to pour the ink in the spring, as it were, right at the beginning, when a child begins to understand and remember throughout his unfolding career, that people and bugs and snakes and air and water somehow belong together, and that these things are all bound together in the bundle of life. This is a fundamental human apprehension, which, if not quickly gained and steadily nurtured throughout an educational process, simply creates a generation of beer can flingers who simply do not understand.

Speaking then, not as a theologian but rather as one who has been for 28 years involved in education, I can think of no proposal to growing young people which, given the advantages of visual aids and multi-media presentations, would excite so vivacious a response. For it deals with what children know to be true, that if one kills vile snakes, he also destroys lovely trees, because the vile snakes eat the bugs that prevent the destruction of the trees. It is not a great intellectual achievement to know this; in a sense it is the primitive knowledge that a child already senses that things belong together.

I think the bill, inasmuch as it is directed toward a presentation of "how man lives in this bound-together world," if administered with intelligence, and, as my colleague suggested, with a calling upon the ecological, pedagogical research know-how that is already available, would be a significant contribution directed to the tenderest spot in the public response.

Thank you very much.

Mr. Brademas. Thank you very much, Dr. Sittler.

Without objection, your prepared statement will be included in the record as if read.

(The statement follows:)

Man and Nature

Because the national need to which this Bill addressed itself is a complex and delicate one, our reflection about it requires a level of thought far deeper than is commonly required for a judgment.

What man does with the world-as-nature is a result of what he *thinks* about nature: it is shaped in the profoundest care of what he *feels* about the natural world, what evaluation he has of the world of things and plants and animals.

If the world of the not-self is felt as a mere resource to be used it will surely be abused; if the world is regarded as a gift, a wonder, as a reality having an integrity of its own—it will be rightly used.

That proposition is swiftly and powerfully true; and our present ecological crisis is a result of the denial of its truth. For nature, though often silent, is not without power to condemn as well as power to bless man. And when man so uses nature as to deny her integrity, defile her cleanliness, disrupt her order, or ignore her needs—the reprisals of insulted nature take an often slow but terribly certain form. Nature's protest against defilement is ecological reprisal.

Man cannot be man against nature; he can only be man with nature. For man belongs, too, to the world-as-nature. If out of ignorance, or apathy, or aggressiveness he tears the fabric of which his own life is a part, he destroys himself as well as the mighty structure from whose womb he was born, in whose web he has had his unfolding history, and whose support and companionship-in-life is the primal place and ground of his existence.

Managerial man forgets this. Nature is patient. She permits him to make steel out of ore, and limestone, and coal and sophisticated chemical operations. But if, in that creative and legitimate work he befouls the air, pollutes the water, and deals rapaciously with the unretrievable and irreplaceable stuff of nature, patient nature begins her quiet but implacable counterattack.

How, then shall the mind and spirit of a nation be addressed by this ecological fact—that man and nature are bound together in the bundle of life?

Education is not the only way; but it is an important way. And, speaking as an educator, I can think of few areas of life that could be so naturally fitted into a course of study. For the things ecology points to and deals with are the immediate actualities of our lives: air and water, plants and animals, forests and bugs and birds and spiders and snakes. And the high specialization of man's historical life whereby a primal organic wholeness of life is ever more deeply threatened would, in my opinion, guarantee a student response of great vivacity. For what is happening to fragmented man—as a human person confronts in the vast ecosystem of nature a model of community, interdependence, and balance which, beheld and honored, bestows upon man a vision of wisdom, and order, and is tutorial to the future of man—is history.

For the possible correction of the wrongs we have done in the past there must be regulative, protective, ameliorative action directed to the producing, fabricating, consuming, beer-can flinging adult public. But the action this bill proposes, because it is addressed to the young, is even more crucial. It is directed toward restoration of a rational way of life—and its truth, because a part of public instruction, is truth poured into the very spring of the future.

Man's "Dominion" Over Earth

Mr. Brademas. Let me refer to the famous lecture that was delivered by Dr. Rene Dubos in October 1969, "A Theology of the Earth," in which Dr. Dubos took issue with the thesis of Professor Lynn White, Jr., out in California, which thesis on the part of Dr. White was that the Judeo-Christian tradition had been of considerable influence in bringing about the erosion of the environment, certainly in the United States.

Dr. White, you may recall, from that essay, alluded to the first chapter of Genesis, in which it is written that man and woman were given the right to subdue the earth, and have dominion over all living things. Dr. Dubos quarrels with Dr. White at this point and suggests that the ancient Greek and Chinese and Moslem civilizations didn't have that good a record in terms of their respect for the earth. What do you think about that as a theologian?

Dr. Sittler. I checked that out just before I left to come down here; I knew of Dr. White's article and also Dr. Dubos' response. And I spoke yesterday afternoon to the professor of semitic studies at the Oriental Institute. In the Semitic language what does the verb "to have dominion" mean? And he said "to have dominion" means exactly the opposite of what it has been thought to mean when one translates from Hebrew into Latin, which was one of the earlier translations of the Bible. The term is understood as "domination," a kind of political word meaning "to exercise control over," but the proper translation would be "to exercise tender care for." And this is almost a 180-degree shift in the meaning.

Understanding Genesis in its context, man was ordered so as to live with God's other creation, the earth, that he was to regard her as the object of his guardianship. In fact, the word is used in the sense that man is to care for, he is to have dominion in the sense of exercising his intelligence to see that her integrity is not abused.

So I think Lynn White is right when he says that, on

the whole, the tradition has been misunderstood to mean that man is given a holy charter to walk through the creation in arrogant haughtiness and do what he pleases with it—which is exactly the opposite of the intention of the statement in Genesis.

Mr. Brademas. I wonder if the new English version takes that into account in translation.

Dr. Sittler. I just checked that out in the New English Bible, which ten days ago, with considerable publicity, was announced by the publishers. The passage is translated in such a way as to suggest to the mind that the relation is not one of arrogance or overlordship but is one of care and responsibility.

Mr. Brademas. There is one other question I would put to you, deriving again from that lecture of Dr. Dubos.

You will recall that he was commenting on Lynn White's lecture in which there was the statement, "St. Francis of Assisi ought to be the patron saint of ecologists." But Dubos said, "No, it ought to be St. Benedict, because he [accepts] creative intervention"—alluding to interventionaries of medieval times . . . [while] St. Francis symbolizes passive worship of creation. Do you have any comment on that particular squabble?

Dr. Sittler. I should like to relate these two statements by introducing a third one. I think both men are right. Let's introduce the third man and then interpret the others.

St. Augustine made a marvelous statement once, in which he said:

"It is of the heart of evil that men use what they ought to enjoy and enjoy what they ought to use."

Now, he meant by that, as the context makes clear, that unless one stands before the world with enjoyment, that is, with appreciation of its wonder, its beauty, its otherness than myself, he will certainly abuse it. If he enjoys the world for itself, then he must be trusted sanely to use it because he regards its own given nature.

Now, I think both Francis and Benedict deserve to fit under that category, because Francis, as it were, was the apostle of the enjoyment of the wonder and beauty and freedom of nature, and Benedict was the saint who affirmed that.

Men are supposed to deal with nature, our sister, in such a way as to managerially unfold her toward her fullest possibilities.

Well, Benedict is probably the father of contour plowing, and the Benedictine Order for many generations or centuries taught medieval Europe how to deal with earth, trees, plants, animals. The monasteries really were for hundreds of years the school in primitive ecology.

Mr. Scheuer. They were your ecological institute.

Mr. Brademas. Thank you very much, Doctor. Mr. Hansen?

The Need for Broad Participation in Environmental Education

Mr. Hansen. Let me also express my appreciation for your presence here and your testimony, which has been fascinating.

My only question is whether you see in the legislation before the subcommittee a promising and productive approach to the development of the kind of understanding that you spoke of. Will this be a useful tool in achieving this understanding of nature and of our responsibility?

Dr. Sittler. I think, sir, it can be a useful tool, if, as the thing passes from vision and enactment into exercise, it is not permitted to fall exclusively into the hands of the educators. For this reason: There must be educationally, pedagogically trained, people involved. But I fear for any effort which falls too absolutely into the hands of those whose only training is procedures of pedagogy. There are dimensions of this problem that are visual, poetic, spiritual, historical, economic; it is a very large bag. And I have been an educator long enough to fear my own crowd and its over-specialization.

We tend, as other segments of society, to imagine we know more than we know and to think of ourselves more highly than we ought to think, as St. Paul says. So the approach must be many dimensional.

I suggest, sir, that it would be highly appropriate that in a kind of elementary and secondary school education aimed to awaken man to his existence with the fellow creation, that not just statistics or before-and-after pictures, and so forth, but aspects of American literature in which we encounter a marvelous body of material dealing with problems of this kind, ought also to be introduced.

I am a kind of frustrated poet; and I shall not inflict that on you—but there is a body of contemporary poetry directed exactly to this question which ought to be in the curriculum just as *Alice in Wonderland* was in the curriculum of my childhood.

Mr. Hansen. Are you saying also that in addition to the responsibility that educational institutions may have, that others, such as churches, other noneducational institutions and organizations, should in some way be brought into this process and come within the scope of this legislation?

Dr. Sittler. Yes, sir; I think that would be true.

Mr. Brademas. If my colleague would yield; am I not correct in understanding that the National Council of Churches is now beginning to do something in the field of ecology and that people in your profession are beginning to consider, as a responsibility, thinking through the religious implications of the ecological crisis?

Dr. Sittler. Yes, belatedly, I think they are. I am writing a book on the subject, and some of my colleagues in other areas of Biblical, theological, historical work are beginning to work on this matter. So there is a rising tide of imaginative and scholarly work.

Mr. Hansen. Thank you very much, Doctor.

Mr. Brademas. Mr. Scheuer?

Religious Views of Population Control

Mr. Scheuer. Well, we all thoroughly enjoyed your testimony, and I know you have given us a number of things to think about, Dr. Sittler.

You may have heard that Dr. Cole testified on the matter of population, and I suggested we ought to have a zero rate of population growth. He answered to the effect it probably ought to be a negative rate. We probably ought to have a declining population for some period of time.

Now, here we are getting right into the domain of the theologian, and I think it would be interesting to us if you

would give us the views of an eminent theologian on how we ought to be approaching the business of cutting down on national population—[a] policy and program—and how do we relate the individual created in the image of the Lord, everybody's Lord, with all of the individual rights and dignities of the uniqueness of mankind? How do we rationalize our long-held religious and political precepts of the uniqueness of the individual and his dignity and integrity with the insistent demands of our environmental ecological theories for a stable if not declining population?

Dr. Sittler. Mr. Scheuer, I too have been involved in reflections about this matter with my colleagues in the theological community from the various Christian and also the Jewish community, and I know something about that.

Let me say that the definition of the "good and the moral" is more and more being understood not to be a static or a given pattern but is one which seeks in a moving, changing, dynamic, unfolding understanding of history to redesign and restate what is the "good," the "moral," the "fitting" in any situation. [The opposing position is] the old traditional Roman Catholic position of natural law, which can be interpreted to mean that interference with reproduction is an offense against natural law.

But there are theologians within that community, too, who are saying, "That is one way to read natural law. But if nature changes in regard to man's relationship to it, and if man's relationship to the world, as nature, results in too many people, then the intention of natural law can be understood in another way."

Mr. Scheuer. Thank you very much.

Choices of Social Values

Mr. Brademas. I have just one other question, Dr. Sittler, before we let you go. And that is a rather fundamental question in this country right now. And that is—and it has been alluded to by Dr. Cole—the worship, as it were, of the almighty GNP. The question is if we are really going to make any significant headway in meeting the whole spectrum of issues that we call "the environmental crisis," must we require a fundamental shift in the values of the American society [and] no longer believe that a constantly rising gross national product must be the fundamental public and private objective of this society?

And in this respect, I note the statement of Dr. Murray Gellmon, the California physicist who won the Nobel Prize this year, in which he said something to this effect: The mark of a really mature and civilized society is its capacity to decide not to do certain things of which it is technologically and scientifically capable.

So I guess the question is: Are we really going to be able to do anything other than saw at the wind in this field unless we move toward some fundamental shift in values in this society?

Dr. Sittler. This is true. It seems to me the relevance of this bill is that it understands, at the point of priority of value, the crucial point. There must of course be legislation to restrict, ameliorate, to correct and do something about past blunders. But this bill moves at another level it seems to me. It seeks to shake the value-choosing minds of the future rather than do a kind of vacuum cleaner job on the mess of the past. There has to be some of that done, to be sure. But the bill is for the next century, not for the next biennium; will men really come to see this? Well, maybe. There is a beautiful phrase in the Old Testament: "The Lord gave them what they wanted and made them sick of it."

This may be the way the human mind changes—by a sheer surfeit of quantum, within which one begins to create the distinction between quantity and quality. This comes, I think, in the mood of the generation now coming to maturity, in which they have so much that falls apart so fast that a longing for sheer craftsmanship, or the less that is better, is not beyond the realm of possibility. We might be in again for an age of hand craftsmanship in certain things.

I am not a pastoral romanticist, and I do not think tractors can be hand crafted to deal with the land. But there are evidences in the culture of a kind of sardonic evaluation of sheer quantity, a line that goes always up on the graph, to which my own kids say, "Very big deal. So what?" But I understand them, because as my car falls apart every fourth year, I say the same thing.

Mr. Brademas. Dr. Sittler, thank you very much indeed for your eloquent testimony.

Dr. Sittler. Thank you, Mr. Chairman.

Introduction of Robert Motherwell and Helen Frankenthaler, Artists

Mr. Brademas. Our final witnesses are two distinguished American contemporary artists, Mr. Robert Motherwell and Helen Frankenthaler. Would you like to come forward, please. We look forward to hearing from you.

. . .

Mr. Motherwell. Thank you. I must begin by saying that my wife wishes me to speak for both of us, though she was invited to speak in her own name, as Helen Frankenthaler.

Mr. Brademas. We are in an era of women's liberation. And, as a bachelor, I find it enormously reassuring.

The Chair wants to say how very pleased we are to welcome you, Mr. Motherwell, as one of the leading American figures in the world of art. We look forward to hearing what you may have to say. I take it from your having been here on some of the previous witnesses' testimony, you may have some idea of some of the kinds of questions we hope we can hear from you on.

The Nature of the Artist

Mr. Motherwell. Thank you again. I regret that I only partially heard the second man testifying. I found beautiful and measured (and myself in total agreement with) Dr. Sittler who just preceded me. The following is what I wish to say today myself.

I am sure that scientists have or will testify to the relevant facts here and know them far better than I. I speak only as an artist. But to speak as an artist is no small thing. Most people ignorantly suppose that artists are the decorators of our human existence, the esthetes to whom the cultivated may turn when the real business of the day is done. But actually what an artist is, is a person skilled in expressing human feeling. And if the "real" business of the day has led to a distortion or a petrification of

human feeling on the part of the participants, as, for example, when a builder mows down the trees on a tract of land because it is easier and cheaper to build the house on empty ground, and the worker who drives the tractor that plows down the trees to do his job in order to race home for a beer and a TV western does so, oblivious to the hurt to the landscape and the hurt to the ultimate house buyer, who—if he has sensibility and limited means—will plant saplings that will take a generation, or two or three, to reach the stature of the trees mown down in a few minutes—then we are dealing with a business of the day that makes the builder and the worker looking later at a masterpiece of landscape painting—say, a Constable or a Monet in a museum—a cultural transaction so grotesque and absurd that the most extreme plays of Ionesco and Samuel Beckett are less absurd than everyday life itself.

The first-mentioned playwright has said he has only felt "happy" when he was drunk, as millions of young people now seem only happy when drugged, which are indeed two ways of contending with the nausea that a person of sensibility must feel when he looks at the waste of modern civilization, covering the landscape like a slimy coating of vomit.

What kind of a race of men is it who rape or vomit on the landscape, like drunken soldiers in a conquered village, or like destructive and greedy little boys let loose in an enormous toy-and-candy store, to break and gorge as they like; while other little boys, in other parts of this planet that we Americans are turning into a garbage dump, stand with a piece of string and an orange as their treasures?

As an artist, I am used to being regarded as a somewhat eccentric maker of refined, but rather unintelligible, objects of perception. Actually, those objects contain a murderous rage, in black and white forms, of what passes for the business of everyday life, a life so dehumanized, so atrophied in its responsibility that it cannot even recognize a statement as subtle and complicated as the human spirit it is meant to represent. I am as well, at other times, an expresser of adoration for the miracle of a world that has colors, meaningful shapes, and spaces that may exhibit the real expansion of the human spirit, as it moves and has its being.

Man's Powers of Destruction

But, as every artist knows, this is expressed in the middle of, and despite, the vomit that surrounds us, a nauseous waste that makes the incessant and endless chewing down of trees by beavers, for instance, seem amateurish and almost benign, since they do not have the technology that we humans do to destroy on a huge scale. If we gave the beaver our tools, the forests of the world could disappear in one day. We are slightly more sensitive. It might take us a generation or two; or again, perhaps not.

We are certainly capable of destroying the forests of the world, of destroying everything that is not already covered with vomit, as well as everything that is, in one day.

I suppose that America began as a few people, on a vast tract of land, so vast that one could be as greedy and wasteful as one wanted, and there was still more. That time is gone. Now we are millions of people, and millions more in the offing; that vast land is becoming more the scale of a park, humanly speaking; but a park filled with waste: rusting cars, bottles, garbage, enormous signs seducing you to buy what you don't want or need, housing projects that don't show a rudimentary sense of proportion in any shape or line or material, suburbs that are a parody of the barrenness of the Bronx, and of the gaudiness of Las Vegas.

Indeed, if God had said to a group of men:

> Here is a vast park, of millions of square miles. Let's see how quickly you can cover it with everything that is an affront to the human spirit. And, above all, be certain that it is done on a grand scale of extravagance and waste, and of lack of regard for the sensibilities of the inhabitants of the other parks of the world.

Then we might by definition call that group of men that God so provoked "Americans."

No wonder our youth are up in arms! They are in order to preserve their sanity, in the midst of a vulgarity, a waste, a contamination without precedent in the annals of mankind. We talk about a "generation gap." I am more optimistic. I prefer to think of it as a "sanity gap," of a young generation saying (in the interest of their growing sensibility that they certainly did not inherit from their parents) to their elders, "The way you go on covering our natural park with filth, waste, and vomit for the sake of monetary gain and monetary economy is insane."

If most of the members of Congress think that they are either leading or in touch with the young, I would remind them of the masterpiece of Renaissance painting by Peter Breughel the Elder, called "The Blind Leading the Blind." Congress may be leading or mirroring the so-called silent majority, but persons of sensibility are regarding the scene of vomit with the only possible sane response, one of nausea. And no men, if they can cure it, will endure a state of nausea for long.

I do not know how you legislate the growth of human awareness, or how you make shameful insensitivity to landscape. But if the present bill can in any way do either or both, who could not favor it? Each of us lives a brief moment in what once was a primordially beautiful park that could only elicit a sense of ecstasy and the natural music proper to a virgin place. Does that moment for us now have to be spent surrounded by our own filth, so much of it that it is a problem even to cart it away? What kind of a human existence is that? A gift to our children?

No, it is a dirty joke and a senseless one, and not God's, but our own.

That old cliché, the word "mess," is now taking on a vivid and literal meaning. The American landscape is visibly and literally a mess; the young know it. Let us give them all of our positive knowledge. It is little enough compared to the mess we have given them.

If you want to drive anyone insane, rear him in an environment without a sense of limits. And even our vast reality now is limited indeed.

The Need for Sensitivity

One's mind reels at what men without an esthetic sensitivity have been capable of. Far from being merely dec-

orative, the artist's awareness, with his sense of proportion and harmony, is one of the few guardians of the inherent sanity and equilibrium of the human spirit that we have.

Keat's famous line, "Truth is beauty, beauty is truth," should be regarded as an obvious fact, not an enigma. What is enigmatic is that a whole society—and our modern technological one, which we cannot lose if we would, is the first such one in human history—that a whole society can think that it flourishes when, in fact, its mountains of waste matter reveal a paralyzed and psychopathic state, in the sense of having no feeling, no response to the wondrously complex and sensitive perceptions that are the human spirit itself.

What have we gained in conquering a virgin piece of nature if, in the process, we have destroyed the sensibility with which the human spirit perceives the world, that is, if we have destroyed our capacity to feel? Everyone knows that absence of feeling is the prime characteristic of death. A lot of what we observe among the young these days is their various reactions to moving about in an environment devoid of basic feeling, so as to better manipulate nature in the interest of greed. In short, from moving about in an environment that is deathlike. If they go to extremes in their efforts to revivify our environment, it can only be because of the mortal threat to their lives and state of being that our landscape represents.

The French Surrealists like to think of themselves as "super-realists." In fact, they were subrealists, in their realism, compared to the nightmare of esthetic reality that we patriotic Americans have made for ourselves, without sensibility or principle.

It is interesting that the French have managed to engrain into a whole culture a sensibility as to what one eats. Each meal is a joy. I would that we could do the same in relation to the American landscape! How enhanced all of our individual lives would be!

Mr. Brademas. Thank you very much, Mr. Motherwell. I have been a member of this committee going into my twelfth year, and I think your statement is as eloquent and moving as any I have heard on any subject coming before this committee.

Beauty in an Urban Society

Mr. Brademas. One of the questions I would put to you follows from a statement made by Dr. Sittler, who preceded you in testifying. Dr. Sittler said he was not a pastoral romantic. And I think I am correct in quoting him in saying he was not really suggesting that we could somehow return to an earlier day. We live in a country increasingly urban. You live in the greatest urban area in the country.

What comments could you make on the problem of developing sensitivity to the values of which you speak, in an increasingly urbanized society like our?

Mr. Motherwell. . . . Last night, coming back to New York City from New England, I was tired and mistakenly got off the parkway into White Plains. The endless gas stations, motels, road signs, couldn't lead to anything but my thinking, clearly, that here is a place that is saying, "If you stay here, you can make a quick buck." To put it another way—and here one is dealing not only with theological and aesthetic problems, but with economic motivation: "Does a society, in order to function, have to have greed as its real motivation?" I say this without being unaware of the extraordinary things that America has also accomplished. Indeed, the fact that you here can present such a bill, the fact that an artist such as myself would be asked to speak about it, is an extraordinarily civilized accomplishment.

Mr. Brademas. I know last year when Congressmen Foley and Udall accompanied me in Japan for a conference, we stayed a few days at a Japanese inn in Kyoto. We were delighted and enchanted by the non-commercial low-key nature of our surroundings, so much so as we considered the outrages perpetrated on the American people by nearly every major motel chain in the United States; [we thought that maybe we] ought to go into business for ourselves and set up our own chain of Japanese-style inns without any signs around [them]. And we concluded we would probably go out of business.

Mr. Motherwell. Maybe not. You would certainly get a lot of young people, and artists.

The Role of the Artist

Mr. Brademas. You said another thing that struck me as interesting, Mr. Motherwell. You said that the artist, with his sense of harmony and proportion, is one of the few guardians of sanity that we have in our society. You also remarked that you were perhaps not sure exactly how we could resolve the problem we are confronted with. But what ought to be the role of the artist? This is the big question, and this is your fundamental question, I take it, what should the role of the artist be to help shape the kind of sensibility, or any stronger word you may wish to use, that would be required in a country like this, if we are going to make any significant advance in coping with the attack on the environment?

Mr. Motherwell. Well, I suppose as an artist, per se, one has to go about one's art of making things that are sufficiently beautiful in terms of their expressive purpose. Perhaps if another's sensibility is trained on them, it in turn will gain some sense of proportion and color. But, as social individuals, apart from being artists, it seems to me that artists (and intellectuals in general) can only do one thing, which is, constantly, like gadflies, to bite the bottom of whatever horse is running the world, to make it aware—of course, we are brushed off as easily as a horse brushes flies off with his tail. Nevertheless, the American tradition—sometimes I think New England should have been called "New Scotland"; I say this as a person of Scottish descent—the American emphasis on the "practical," which makes it possible for us to do some quite extraordinary things, is nevertheless a prison for other dimensions of the human spirit. The aspiration of life is joy. Otherwise, life is unendurable. In the end, our real political instincts are not about parties or systems of government, but about those situations in which the "establishment" is obviously depriving the people of any joy in just being human beings.

Mr. Brademas. I could put many other questions to you, but I want to be sure of my colleagues having an op-

portunity also. Mr. Hansen?

Mr. Hansen. Mr. Chairman, I also want to express my personal appreciation for a very eloquent statement. I think it is evident that these hearings, in addition to serving their intended purpose, will also provide a means for development of some rather exciting literature on the environment in the form of testimony such as yours and other witnesses we have heard this morning.

You have indicated, I think, quite correctly that the real problem is one of a development of attitudes, the shaping of values, if we are going to salvage the environment that is our heritage.

. . .

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer. This has been an exhilarating morning. I couldn't agree more with my two colleagues. We owe a debt of gratitude, and I am glad your predecessors are still here, to all of you.

Mr. Motherwell, you mentioned in your testimony that we don't have to be so rich. I quoted Senator Muskie before as saying, "We may have to hold down our standards of living to hold down pollution."

In effect, aren't you saying that we can only maximize our richness, the real pleasures in life, if we control our material production, if we control the exploitation of the countryside around us? Are you not trying to say that what we should be trying to do is maximize our richness, our satisfactions by perhaps moderating the production of goods and services and therefore achieving a higher quality of life?

Mr. Motherwell. Yes. In my opinion—and I am certainly no economist—emotionally speaking, I mean to use it as an emotional metaphor, we have a kind of laissez-faire going wild. Esthetically speaking, the small businessman is often oddly more guilty than the large corporations. I mean, the guy who opens the corner drugstore or builds his own gas station or builds his own little business who is often more monstrous than a larger corporation, which, after all, does often employ architects and designers, and so on. But as long as it is a tacit assumption among us Americans that material well-being is alone deeply fulfilling, rather than, as it should be, the sine qua non of what is deeply rewarding, we have a problem.

We are essentially in a senseless situation, of which everyone who does not have a vested interest, who is self-employed, like myself, or young enough, is fantastically aware, and regrets, and feels helpless and futile at the same time. But if there is an "establishment," which sometimes I doubt, it seems to be a question in the case of individuals of thinking that somebody else is really the establishment; if there is indeed any establishment, it is certainly going to fall apart if it does not pay some greater heed to human feeling and sensibilities. We are marvelously educated now; we have succeeded largely in making men intellectually free; and once intellectually free, they will make themselves in their daily lives free from what they resent and feel repelled by. But I am the eternal optimist.

Mr. Scheuer. And what role will you see the artist playing in this effort to give the establishment an ecological and environmental conscience? What role to you see the artist playing in this education process that we are talking about today?

Mr. Motherwell. It seems to me, you know, art is really very ineffective as a political instrument. I think art has rarely changed anything socially or economically. But it does have one extraordinary quality. It does reveal what the potentiality of what the human spirit really is. When I listen to Mozart, then I know what a man is really capable of. . . . If every man does his thing, we would have fewer problems.

Mr. Brademas. Well, that may be a good point on which to conclude these hearings.

Again, I want to express our appreciation to you for your splendid testimony, Mr. Motherwell, and, as well, to Dr. Sittler and Dr. Cole.

Unless my colleagues have more questions, the Chair would like to announce tomorrow morning at 9:30, in room 2257, we will begin hearings with the Environmental Teach-in Panel, followed by the editor of *The Environmental Handbook*, Garrett De Bell, and other witnesses who have been organizing the Teach-in.

We will adjourn for this morning.

(Whereupon, at 11:35 a.m. the subcommittee recessed, to reconvene at 9:30 on Wednesday, March 25, 1970).

DAY 2

House of Representatives, Select Subcommittee on Education
Washington, D.C.

Wednesday, March 25, 1970

The subcommittee devoted most of its second session to hearing testimony from students in recognition of the major role young people have played in drawing attention to environmental problems. Three leaders of the 1970 Environmental Teach-In and two leaders of Environmental Action presented their criticism and suggestions on the bill. All agreed that education is a very significant part of the solution to environmental problems, since values and attitudes—which were seen as the root of the problem—are molded by education.

To varying degrees, the students questioned the ability of established governmental and educational institutions to bring about the radical shifts in values which they feel are required. They suggested a number of alternative models for implementing the bill.

The students were also concerned about the ordering of national priorities, as reflected in the comparison of military and education budgets. However, they did not feel that there is a competitive relationship between efforts to solve environmental problems and efforts devoted to abolishing poverty and racism. Rather, they expressed the belief that environmental problems and social problems are inseparable components of the overall problem of achieving human welfare.

Garrett De Bell, a lobbyist for Zero Population Growth and a participant in the Environmental Teach-In, argued for an explicit emphasis on population control as well as ecological balance in educational programs. He aptly described the complementary roles which might be played by governmental action and personal action in solving environmental problems.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2257, Rayburn House Office Building, Hon. John Brademas (Chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, Meeds, Bell, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronald C. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for the further consideration of H.R. 14753, the Environmental Quality Education Act.

Yesterday, we on the subcommittee heard from an ecologist, a theologian, and an artist concerning the need for Federal support for programs to encourage education in elementary and secondary schools, in universities and in local communities, about the whole spectrum of environmental problems.

Today we are pleased to hear from some of the leaders of the Environmental Teach-In which is scheduled for the 22nd of April, and we look forward as well to hearing from others who have been associated with the projected Teach-In. . . .

The Chair would like to observe how very pleased he

is, as are the other members of this subcommittee—particularly the cosponsors of the Environmental Quality Education Act, including the gentleman from New York, Mr. Scheuer, and the gentleman from Idaho, Mr. Hansen—to note the growing involvement of both high school and college students in our country [in improving] the quality of our environment.

Introduction of Student Leaders of Environmental Teach-In

We will begin by calling to testify as a panel Bill Knowland, student at Antioch College; Karen Buxbaum, student at Bethesda-Chevy Chase High School; and William H. Schlesinger, chairman of the Environmental Studies Division at Dartmouth. Please come forward and identify yourselves. Perhaps you would like to proceed in the order in which I have called your names.

. . .

[First to speak was Bill Knowland, a student at Antioch College and coordinator for the Environmental Studies Center there. His oral testimony endorsed the bill with reservations urging student participation on the Advisory Committee and adequate funding. In addition, he submitted a written statement on the activities of the Antioch College Environmental Studies Center and the Antioch College Science Institute.]

An Elementary School Program for Environmental Awareness

Mr. Brademas. Thank you very much. Could we next hear from Miss Buxbaum and then Mr. Schlesinger, and then we will put questions to all of you.

Miss Buxbaum. The environmental crisis that now confronts us is the result of an ecologically unsound attitude toward life. This attitude has its source somewhere in the educational process. The remedy of the problem, however, also lies in the educational process.

Because formal education begins in elementary schools, environmental awareness should be introduced here along with reading and arithmetic. Montgomery County has the outdoor education program which is now in its seventh year. It presently involves more than 60 schools and 5,000 children. This week the program is expanding into a junior high school as a pilot program. . . .

In brief, the outdoor education program deals with what might be called experiential learning, based on the premise that kids learn from doing. It involves active learning rather than passive classroom listening. At present, the children spend a week at one of three rented rural sites with the principal, classroom teachers, student teachers, and high school students, or adults from the community who are interested in the program.

They learn forestry, astronomy, biology, map and compass study, and more. Ecology is usually taken up late in the week, for it is the terminal of all the other disciplines. As Joe Howard, the curriculum supervisor, says, "This is what ecology is all about. We can talk about man's abuse of his environment, but you don't get a real feeling for it in a classroom."

Unfortunately, each student must pay approximately $30 for the outing, and the rented sites are not well enough equipped to allow optimal use of the valuable time during which the kids are living their education. The 1971 capital budget requests $494,000 for construction of a properly equipped facility on a 9.9-acre site in Rock Creek Regional Park. Also requested is nearly $69,000 for the cost of the land. This facility would be used for inservice training of teachers as well as a spot for the week-long outings.

I question how long 9.9 acres of land will survive constant use by a county full of children and teachers. It seems faulty to spend such money and effort on a project with built-in obsolescence when a larger tract of land would surely have a longer relative life span. Use of any particular part of the land would be minimized and therefore less damaging. But the land is expensive.

New Resources for Planning and Teaching: Community and Student Personnel

Unlike many educational ventures, this outdoor education program could conceivably be expanded to accommodate students of all ages in the public school system if there were adequate facilities and educators. It takes money to prepare both commodities. Sites need to be acquired and teachers need to be trained.

But the teachers on the high school level need not be trained independently of the students. Our communities have many specialists in pertinent disciplines both in higher education as professors and researchers and in such institutions as the Park Service, the Smithsonian Institution, and private industry. City planners and architects would have a significant teaching role in many communities because of their proximity to the city.

Curriculum planning would have to be indigenous to the individual school. Once teachers were trained, they could perpetuate and improve their programs. Once high school students were trained, they could contribute to the efforts with primary school children. This would be a great help to the two student groups, for the high school kids would learn about communication with younger children and at the same time be compelled to understand more fully their subject. The younger children might grasp some concepts more fully as presented by an older student rather than a teacher.

The cooperative effort of student teachers and elementary educators would compel the participants to shelve their famous generation gap for the duration of the partnership in education. Chances are that it would never be brought back out of storage.

The time when high school students would do their teaching could conceivably be during the second half of their senior year. Most high school seniors will agree that secondary education lasts five months too long, for the end of the first semester is the point of diminishing returns. Senior slump sets in and production drops to drastically low levels. . . .

Social and Natural Sciences Aspects of Environmental Education

Within the existing framework of high school academics, there are two aspects to environmental education. The first involves a general exposure that all Americans should have to the crisis we are now facing. This type of general exposure could well be incorporated into the social studies courses such as problems of the 20th century, sociology, and economics as they now exist. Because it is an attitudinal problem being dealt with, it conveniently fits into the framework of courses that study social trends due to economic, political, and historical conditions.

The other aspect of environmental education switches from the social to the scientific. It is in the scientific approach that the word "ecology" becomes meaningful and in the biological analysis that one gains insight into the intricacy of our ecological balances. This more specific instruction is where the excitement and long term challenge enter, but it is also the more difficult of the two sides to expose skillfully and accurately.

Students and educators must feel a commitment to environmental course work for the subject to come alive and be more than academic book learning. Ecology does, indeed, involve a voluminous amount of bookwork, but it must also become a way of life to be meaningful. Instructors of ecology, the science, must be specialists. We do not yet have enough ecologists to go around.

A Summer High School Program: Total Immersion

This is the point in my testimony where I shall bring in my experience last summer: I lived ecology for five weeks under the subsidy of a National Science Foundation summer study grant in Nevada. It was at Foresta Institute of Ocean and Mountain Studies.

Our purpose was to learn. The course material was rigorous, stimulating, and challenging. For the first three weeks, we had an hour of chores, several hours of lectures, about five hours of field research, and several hours of field data reduction each day. On several evenings, we had lectures by our Czechoslovakian and Chilean guest botanist-ecologists. Several nights we slept out in the field, gathering further microclimate data and trapping and observing the nocturnal mammals. Our schedules were always full, so there could be no tardiness or procrastination.

After this first period of acquiring a background in ecological principles and of learning to think scientifically, we all moved up to a large isolated estate on the shore of Lake Tahoe. Here new disciplines were added to the old. Here we acted for ten days as individuals on original research projects. We worked apart, slept apart, and most often ate apart. Our instruments for investigation were simple and often self-designed and self-constructed. I learned about hearing, seeing, tasting, and feeling when I was alone on these several days.

And the staff was extraordinary. They were truly teachers. Each of them was a knowledgeable teacher in the classroom; each lived, worked, and learned with us, contributing equally to our Foresta community.

This five weeks of study was a total learning experience. I discovered things, made instruments, labored hard to learn my subject. The challenges become surmountable; the human relationships grew precious and permanent; and the academics were different from anything I had ever encountered in school.

Ecology came alive for me in Nevada because it became a way of life. For five weeks I was totally immersed in environmental awareness. An incredible amount of time was spent in our small library and lab, but the academics seemed incidental. The outside was always there on the other side of the door, waiting to let me explore it. It imposed no restrictions except that I respect it—so I did. There was a profound sharing there, for as nature gave me the priceless experience of finding my ecological niche in her system, I promised to return the gift by means of that knowledge. I plan to be an ecologist. Before this summer, I felt no inclination toward science.

My experience was too exceptional. Although subsidized by the National Science Foundation, it was an expensive summer. Because scientific research appropriations have been cut, even this program has been discontinued.

Summer school, although it, too, would not reach many people, could provide the setting for programs based on this type of living the subject that I have just described. The effort would need money, flexibilty, and specialists—all of which are presently lacking.

Education, general as well as environmental, must be made to come alive outside the classroom. If your textbook is the world, you always have a ready source of reference available. It should not be such a rare phenomenon that an individual find environmental understanding and awareness. One should not have to search outside of the public school system for the kind of experience I was fortunate enough to have. It must be right there for the asking.

Mr. Brademas. Thank you very much, Miss Buxbaum. Our third member of this panel is William Schlesinger.

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[*Mr. Schlesinger commented on various aspects of environmental education: its history and goals, the need at all educational levels, teacher education requirements, and funding problems.*]

Mr. Brademas. Thank you very much, Mr. Schlesinger, and let me express my appreciation to all three of you for very useful statements.

Environmental Concerns versus Other Social Problems

Let me ask a few questions and any or all of you may wish to comment on them. One of the questions that comes up in talking to the press and to our constituents in our several districts is this: Does the sudden increase in interest—sudden, over the last year or so—on the part of high school and college students in the environmental crisis mean that there will be less interest in the issues of Vietnam and civil rights, which is a question I am sure has been put to you—by the smiles on your faces—many times?

A companion question I might ask is this: Are the same students involved in the Environmental Teach-In those

who would customarily be involved in these other areas of activity?

Mr. Knowland. I can remember those reports coming from as far back as November, and it is utterly fantastic that anyone could even conceive that students can either—well, if it were two separate issues, not concentrate on two issues at once; but the whole point is that the war, racism, urban problems, are not separate problems apart from ecology but they are very much a part of ecology. Ecology is sort of an overall view, the overall problem, and no real progress will be made in ecology until progress is also made on those other fronts, and I think that any students who have gotten into the problem realize this and unfortunately many of the students who were already deeply involved with the war, racism, et cetera, before, are slow to catch on to the broad overview, and there has been some trouble with those people feeling that attention might be taken away.

But I think in regard to students being different who are being drawn into the ecology movement, if you want to call it that, yes, they are different. There are a lot more of them, but they are also being drawn, by virtue of the interrelatedness of everything else, into those other movements, so in the long run I think all will gain strength.

Individual Actions to Solve Environmental Problems

Mr. Brademas. I noted, Miss Buxbaum, in your statement, you observe that we ought to bring environmental education into our systems of learning in both the primary and secondary levels because it is in those levels that one's life style is in large measure determined and shaped.

I wonder, your having used that phrase, if you and your colleagues could tell us to what extent your own life styles have, in effect, been changed since you have made a commitment to concerning yourselves in the environment.

Mr. Scheuer. Have you stopped driving a car?

Miss Buxbaum. As much as possible. Any errands near home, I ride a bicycle or walk.

Mr. Scheuer. Do you use an electric hairdrier?

Miss Buxbaum. No, sir; I don't have enough hair. I live about a mile and half or two miles from school, and my school bus is one block away, and we have—well, starting about a month ago, I have been walking or riding my bicycle to school, and all during the fall I did also rather than take the bus.

You know, this does not stop the buses from running; it is a token gesture on my part. We had a petition going at school for this purpose for students to walk rather than use automobiles or buses for transportation to school, so that they have a foundation upon which to ask other people to change their life styles. If I can walk a mile and a half through the rain to school, then I can ask someone else to use glass milk bottles instead of milk cartons and to recycle paper, this kind of thing.

I suppose that the major change in my life since my involvement in ecology is, I really seriously intend to be an ecologist. All of my college plans I made, my applications and everything, have centered around the fact that I want to major in biology so I can be an ecologist, and I really don't think I am going to be easily swayed from this goal.

I don't know how much more of one's life one can devote—all of college and supposedly a career in a subject. As far as the little things, such as littering—

Mr. Scheuer. Did you say "little things"?

Miss Buxbaum. "Littering" is the way the problem is approached in elementary schools now. Kids go out and pick up paper but that is such a superficial part of the problem. It is not papers, gum wrappers, and candy wrappers around in the parks that is the problem but it is big industrial problems, mass transit problems, this kind of thing, which is really the essence of the problem, not litter.

So I don't throw litter. But that was before this environmental campaign. At my home, we have as of yesterday stopped using disposable milk cartons and have gone back to using the bottles that can be reused.

Mr. Scheuer. What happens to those bottles in the average urban family once they leave the kitchen? Do you have any idea what the recycling process is for bottles in the average urban family?

Miss Buxbaum. The bottles that are returned to the milk companies and to the bottling companies, from everything I have been told, are recycled, each bottle, about 15 or 20 times, and they are sterilized and refilled for circulation, and then after they have fulfilled their lifespan, which is about 20 usages, they are disposed of.

Mr. Knowland. If I may interject, the whole thing, the whole system in the country, whatever word I have to use, is set up against any sort of real, valuable, personal eco-action. This is fine; we can recirculate milk bottles, and it is a good, necessary thing, and it is certainly better than using milk cartons, because the bottles can be reused and can be recycled, and even after outliving their usefulness, they can be broken down and used again and be made into other bottles or jars, whereas milk cartons, when they are burned, cause air pollution and whatever.

The ideal thing would be for people like myself to head off for the backwoods and live on our own there and do things toward cleaning up our own systems, as it would be called. But can you perceive of 200 million people in this country today leaving the cities and heading off for the woods? It is certainly probably true if there were 200 million Indians living in this country today, there would be far more ecological damage being caused—well, I won't say that, but there would be a considerable amount of ecological damage being caused by them as well.

It is a matter of people and it is a matter of especially a highly technologized society such as we developed, and I am not saying a technologized society has to be that way, but with such as we have now, any personal eco-action will not make any significant amount of difference until it is on such a scale it either forces the system to change or the system changes of its own accord.

. . .

The Training of Ecologists

Mr. Brademas. I have many more questions I would like to put to you, but I want my colleagues to have a chance to ask questions, as we have other witnesses. Mr. Bell of California.

Mr. Bell. Thank you, Mr. Chairman. We heard testimony in Los Angeles not long ago by Dr. Libby of UCLA in which he commented that he believed we should establish a school system for ecology resembling medical school, in which a student would study to be an ecologist and would be graduated like a doctor and then pursue this endeavor either with the Government or with some other industry or whatever. What is your view of an educational system, or graduate school like this? Does it appeal to you? You mentioned, or the young lady mentioned, a minute ago, that she would like to be an ecologist, and I am wondering if this is the approach you would like to take.

Miss Buxbaum. An ecologist doesn't become an ecologist until years and years of being a scientist. The men who were my instructors in Nevada were biologists and it was not until they studied for years and years that they felt they could call themselves ecologists, because it is a matter of experience and wisdom that you gain through understanding all of the interrelationships.

Ecology is a very hypothetical thing. You can't have someone sit down and teach you ecology. It is a thing you have to experience, you have to become a part of it, it has to become a part of you, some of it you have to sense intuitively, every situation is new in every interrelationship you encounter.

If you have a factory, a stream, and road here, nobody could have taught you anywhere in your education exactly what is going to happen in that system. You have to have been taught how to analyze that system; so it is different from a very rigidly factualized study such as I presume a lot of medical work is. You can major at some universities in ecology. I know at Cornell University they have a graduate school within their biology department for ecology and systematic majors. So, are you talking about just a standard graduate program?

Mr. Bell. Yes; a graduate program like medicine or law or anything else. I gather, though, from your comments, that you feel you can't learn very much by a regular study course.

Miss Buxbaum. Well, you can learn a lot but you can't learn to be a real ecologist the way—well, it is such an experiential thing.

Mr. Bell. We must recognize there are many facets to ecology.

Miss Buxbaum. Yes.

Mr. Bell. And there are, of course, many problems that have to be solved and they have to be solved sometimes quite scientifically because they are very complicated.

Miss Buxbaum. Yes, sir.

Mr. Bell. Would you like to comment?

Mr. Knowland. I would. Ecology has very quickly become such an all-encompassing thing, but I think we can break it down into two fairly distinct types of meanings, for education at any rate. Number one, for general education purposes, ecology is more of an attitude perhaps than a body of fact that you need to know. This is what we need to instill the general citizenry with. Also, there is a very definite and crying need for what you're asking—for technical ecologists, as it were.

There are some good programs, some good graduate programs already in existence around the country—Cornell, Michigan, Stanford—but much more is needed.

I think such things as John Fisher suggested in his article in *Harper's* magazine of September, calling for a survival university in which the whole focus of a liberal arts education would be centered around the one unifying principle of survival—this is the type of thing which we are going to need.

The whole point of the ecology movement may be that our educational system is way off base right now. This is certainly true at elementary, secondary, and undergraduate levels and even at the graduate level. I think we are going to have to seek innovative, completely new programs of virtually any nature; perhaps a med-school-type thing would be good for developing the type of technological ecologists we need, but all sorts of innovative and quite different things need exploring.

Shortcomings of Our Schools

Mr. Bell. You made quite a few comments here about how our system must be radically changed in a functional way; that is, both our education [illegible] assume you mean our governmental programs. In a [illegible] il sketch, what do you think should be changed abo[illegible] educational system?

Mr. Knowland. Everything.

Mr. Bell. That is interesting.

Mr. Brademas. We don't have time to discuss that, I think.

Mr. Bell. Well, I said a thumbnail, across-the-board sketch, and I don't want to put you on spot, but I am just curious.

Mr. Knowland. If I could summarize it, the whole purpose of this country was set up to insure life, liberty, and pursuit of happiness for all citizens, and that certainly is not an easy process, no matter how it is gone about. Right now I would think that it would be fairly obvious that on far too large a scale we are failing and certainly new methods and new attempts to reach that goal should be explored and attempted.

Miss Buxbaum. As far as the education is concerned, I am really not prepared to overhaul our whole American system, but as far as the educational system, I am in my last year of what almost all students have to go through, the primary and secondary public school system, and there has been a lack of purpose that I can look back on and say, "I did this for a good reason."

I did this so I could go to college, even before I wanted to go to college; there were a couple of months this year where I was not really sure; but I was not going to school each day to learn how to live; I was going to school to learn some facts. I sat through French classes year after year, and I am in French 6 now and I don't have any interest at all. It has not done me any good at all.

If I had not been fortunate enough to be in the program last summer, which was not part of the educational system, the public school system, then I think I really would have missed the boat the whole way along after all of these years.

Mr. Bell. Speaking of just this kind of concept, we had some people in our "teach-in,"—our hearings—that have

gone further than you have—they claim that the best thing to do is to throw out books and teachers and throw out the school system and start all over. But I believe you are thinking in terms of keeping the good aspects of our teaching system, maybe most of it, maybe half of it, and also throwing in some additional things you just learn by going out and seeing and living, adding that as a part of the curriculum, I assume. Is this your concept?

Miss Buxbaum. Yes. I have no interest in discarding the system as it is. I have a great respect for the teachers and for the system because it has taught me a lot. But it has also left me out in the blue on a lot of things. A lot of things, if I had not been me, I never would have experienced. I am here because I am a particular kind of person. I got myself into the program last summer, but for someone who had not had that experience last summer, he would not have had this experience I am having here and he would never have a lot of things I am having, because he missed one opportunity that set the ball rolling.

There are a lot of good programs that need to be more readily available, and there is a lot of basic freedom in the system that needs to be installed that is not there now.

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The Importance of Social Sciences in Solving Environmental Problems

Mr. Scheuer. I want to say what a great thrill it is to hear you young people talk. It gives us the feeling that although colleagues in government at every level have done a fairly poor job, perhaps a remarkably poor job in our treatment of the environment, the next generation will do a lot better. . . .

You say you have not had much inclination for science, but now you are determined to get your college training in biology in order to be an ecologist?

Miss Buxbaum. Yes.

Mr. Scheuer. I am delighted by your commitment to ecology. I would be very proud if my daughter, who is a freshman at college, decided to spend her life as a mother or community leader or civic leader or professor in a college. Let me suggest if you are interested in the social sciences, perhaps rather than the natural sciences or art sciences there is an enormous need for people interested in the environmental ecology with economic training and sociology.

Well, for example, you have heard about the worship of GNP, of a galloping gross national product. You see institutional advertisements by the electric utilities begging, urging, pleading, cajoling people to consume more electricity. The scientists will tell you there is no way we can consume more electric power. You have heard of the need for fossil fuels which do not have fallout into the environment or atmosphere. There is a desperate need for people trained in economics and sociology to take the technical decisions and advice that the scientists have given us and help us weave them into the different phases of our life.

I want to suggest to you that if you have this terrific commitment, and if your natural bent is in community work and economics and sociology, which you obviously have, you should not go into science, because at the present time we have far more knowledge which the laboratory scientists have given to us than we have workers out in the field. And if you really want to do something about the major industrial environmental pollutants—and we know who they are—the answer is in the political support that people like you can give to our city governments, our state legislatures, and our colleagues in the Congress.

I assure you, years from now when you are of voting age, if you come to visit your legislator or the head of your community, or your League of Women Voters, your Catholic action group, your Jewish community council, your Protestant welfare, whatever it is, and if you talk with the knowledge and commitment that you have displayed here today, you will have an influence that I can't begin to describe to you.

So I say to you, if you are thinking about going to college, preserve all of your options and you will have a fantastic impact on ecology and your environment with training in sociology and economics. . . .

In a sense, what I want to suggest is, do your "thing" in your own way and if your bent is to "tell it like it is," with the wonderful, convincing, charming eloquence you have shown, then train yourselves in economics, biology, and the like, but do that.

. . .

Thank you, Mr. Chairman.

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International Aspects

Mr. Hansen. Let me put one final question, and any of you may respond, and it deals with the aspect of the problem not yet touched on. Reference has been made to what has been termed a national problem in the deterioration of the environment. To what extent have you addressed yourselves to the international aspects of the problem?

We may convince ourselves that we can live in isolation in some other aspects of our life, but it seems to me in stark truth we cannot, in matters of environmental quality. Either we all survive or none of us will survive. This forces us to deal with the problem on an international basis and to reach some kind of common objective and a means to reach that objective, recognizing that the air we breathe does not stop at the international borders, nor does the water that circulates in the ocean.

Mr. Schlesinger. I think is has been looked at a great deal by college students with a couple of points of view. One, I think many of them say "clean up our own backyard before we go around the world to do it." It is realized there is an international problem and that the earth itself is one ecosystem, and it disappointed a lot of college students greatly that the DDT ban did not really affect international exports and things along this line. I think this is one good example of how students have realized it is an international problem and should be dealt with that way.

Mr. Knowland. The whole point is, we do have but one biosphere, one small spot of life in a vast universe, so

far as we know it, which may be literally devoid of anything else of that nature.

Mr. Scheuer. Why do you understand this so well, while we members of Congress do not understand it at all?

Mr. Knowland. I wonder, sir; whether there really is a difference in the generation gap, you might say, between older people and younger people, whether the fact that we have been supplied with the basics and the necessities of life so easily that we have had a chance to sit back and look and ask why, instead of just how, for a change. If so, hopefully, it will be a good and wonderful thing. And perhaps that will be one of the finer benefits of the $24 billion or whatever was spent to get to the moon.

. . .

A Proposed Youth Conservation Corps

Mr. Meeds. In addition to the legislation which we presently have before us—and I hope the chairman does not mind if I depart just momentarily—but a number of us, I think most all of us on this subcommittee, are also sponsoring legislation which we refer to as the Youth Conservation Corps, which provides for 70 days of work at a reasonable rate of pay in the National Forest, Bureau of Public Lands, and in the National Park systems of this country. That is essentially a work summer experience in helping to provide trails and conservation by preventing soil erosion, and things like this, on our national lands.

Would you think that this type of program that we are considering here today could also be fitted into that to enhance the environmental experience of the actual work?

Miss Buxbaum. Well, I touched on it in my testimony and because of the matter of timing, there were a lot of things I didn't bring up, a lot of innovations I feel have to be brought into the school system, that would provide this kind of training that is away from the school, that is out doing what you are learning. One can't go out and practice ecology without some factual knowledge he has been given in the classroom; but he can't do anything with the factual knowledge unless he has a chance to practice it.

I feel that this kind of working for the problem, not just for himself to learn it, but working for the problem is a very integral part of the environmental education.

. . .

Mr. Knowland. I might comment that a program such as the Youth Conservation Corps might be a very valuable method of acquainting a large number of, well, especially inner-city-type youths with outdoor experiences which they might not otherwise get. Something which struck me pretty deeply since I first read it, and I have forgotten who said it, but that an American, if he is anything new and different at all, is simply a civilized man who has renewed himself in the wilderness. And this could be the sense of what was the American character and something which seems to be fading out of whatever the American character is today, and is something I don't think we need to lose—I don't think we can afford to lose, rather.

. . .

Ecological Problems of Cities

Miss Buxbaum. Mr. Meeds, I would like to add one thing. Our discussion seems to have been centered on the wilderness area and outdoors type of things that are beautiful and pleasant to do, but there is also a problem with the cities. I am not sure whether I am interested in this totally rural ecology problem or whether I would be more interested in going into the urban problem of sound ecological development: city planning and wise architecture and its relationship to the area that is being developed, which also needs ecologists on the teams.

When cities are built, they have road construction people, architects, sociologists, and everybody else that fits into it. But they must have ecologists also to build a city that is going to be able to sustain whatever natural vegetation or animal life is left. You can build up a city and leave a park, but if you do it wrong the whole park is going to die because of the way it is built. So this is part of it and this kind of thing could also be incorporated in what you just brought up. Perhaps the inner-city people that Mr. Knowland brought up should not necessarily be deported out in the country to understand the country. Since they are the ones that are going to have the best understanding of the city, they should be the ones that are getting themselves involved this way.

There is no sense in taking a city person just to let him see the trees and let him taste that before he goes back to the city, just as there is no sense in taking someone who spent his life out in the Midwest on a farm and putting him into Chicago and letting him try to develop a city, develop a new housing project. Forces can be utilized where they have the best background. If it is in the history of an individual to have lived in the city and he knows how to cope with it in a certain way, he is going to be more prepared to propose remedies and solutions to new problems.

Mr. Meeds. Your point is very good. This is an extremely diverse field and it needs to cover a very broad spectrum, and I would agree with you.

Thank you all.

Mr. Brademas. Thank you very much.

And may I thank Mr. Knowland and Miss Buxbaum and Mr. Schlesinger for your most helpful testimony. We appreciate it very much indeed.

Introduction of Garrett De Bell, Editor and Lobbyist

Mr. Brademas. We will now hear from Garrett De Bell, who is editor of the *Environmental Handbook*.

Mr. De Bell. . . . I am Garrett De Bell, the Washington representative of Zero Population Growth, whom I have recently started working for, as a registered lobbyist. ZPG is actively working for stabilization of the population of the United States and is seeking constructive solutions to the environmental problems that result in part from excessive population size. We lobby for legislation that makes ecological sense, support public officials whose policies make ecological sense, and work for the defeat of those who do not.

I am sure that there is general agreement that education and public awareness of ecology is critical to the resolution of the ecological problems that threaten the quality

of life and even the future existence of the human species. This hearing is evidence of this committee's commitment to do something in this area. ZPG applauds the purposes and intent of H.R. 14753. We will make the bulk of our testimony in the area of changes that we feel will increase the effectiveness of the bill.

Zero Population Growth

Zero Population Growth is concerned with the environmental problems that are a direct and unavoidable consequence of a population that already exceeds a reasonable size and continues to grow at an explosive rate. If the U.S. population is not stabilized, we will have to contend with a population of over 300 million by the end of the century. There is very little chance of solving any of our social and environmental problems if this growth continues. The relationship of population growth to environmental problems is not stressed in H.R. 14753. We suggest that the wording be modified to specifically include population and the balance between population size and environmental quality. We propose that section 2 (a) be changed to "of its ecological balance and the balance between population size and environmental quality is in . . ." Throughout the bill the term ecological balance should be followed by the phrase "and optimum population size."

The need for environmental education, I think, is very clear. For instance, Congressman Scheuer just made the remark we need to go to a three-child family in the population increase.

Mr. Scheuer. May I remove any concern of yours that we are not keenly concerned about population. I was the author of a bill that would execute a comprehensive reorganization of the Family Planning Services and that would give us a Manhattan Project approach to the development of family planning needs, and techniques that are appropriate for underdeveloped population. Senator Tydings introduced this bill on the Senate side. And I think most of the members of the subcommittee joined in sponsoring the bill. So rest assured we are quite aware that the implications of population growth are relevant to the question of the environment. We share your concern.

Mr. De Bell. We are quite aware of the bill and support it. The point I wanted to make is, that a three-child family would be a long way from population stability. In fact, if from now on every family in the country were a two-child family, we would still have such a rapid population increase that it would go up to about 300 million.

Mr. Scheuer. I understand from the demographers that a zero rate of population growth would be something like 2.2 children per family.

Mr. De Bell. That is true in a steady state population. Right now, we have a growing population and have been growing in the past.

Mr. Scheuer. And that a two-child rate of reproduction would give us a rather rapidly declining population.

Mr. De Bell. That is true in a population which has remained stable for a while. Our population has been growing for the last few generations, in fact since 1492. This means, each year we have a bigger age class of women at childbearing ages. To level the thing off, you have to sort of shrink it back down in all age classes, and this requires a negative rate for a while. There are two different situations in population. The population has been growing in the recent historical past versus one that has been stable. They have different age structures or percentages of people at each age. We can get into details later. Throughout the bill, the term ecological balance should be followed by the phrase "and optimum population size." We think this is critical to any area of ecological education. . . .

Why Universities Have Failed to Meet the Environmental Crisis

I think it is very important that this committee consider the overall role of the universities in the environmental crisis. The problem has not been simply lack of effort in one phase or another of environmental problems. Rather the basic purpose of the universities in teaching and research has been to encourage ever-increasing specialization and professionalism at the expense of the broad education necessary to a democracy that depends on an enlightened electorate.

A large majority of the faculty of our large universities is dedicated by training and habit to the overspecialized type of study that has been a major contributing cause of our present state of ecological crisis. They are fond of blaming all problems on "the administration," or a conservative board of trustees, or lack of funds, but the problem has been the reluctance of the faculty to continue their own education and growth as times changed and their failure to develop, and even to allow others to develop, truly interdisciplinary teaching and research.

The situation here should be very familiar to you gentlemen as a very similar one prevails in the U.S. Congress, that is the committee and seniority systems which reward longevity and specialization—not ability and dedication to human purposes. The seniority system prevails in both the Congress and the universities. In both, it has prevented those institutions from effectively dealing with the problems of our times. You are familiar with the situation in Congress. I will touch on the problems the seniority system causes on the university campus.

The older faculty control the committees that set course content, faculty hiring, fellowship support allocations, and degree requirements. They decide on faculty advancement primarily on the basis of professional standing as determined by output of publication of suitable specialized papers. Creative teaching, interdisciplinary research or teaching, or working to develop action programs based on sound knowledge are not regarded as valuable ways for faculty time to be spent. The rewards for both faculty and students go to those who will become highly expert in some narrow area of specialization.

Some of this specialized research is socially valuable and, as I can attest, some of it is of great academic interest. But in a world that is rapidly approaching disaster, we must question our priorities. After seeing how well the faculty at our universities have enforced specialization at the cost of breadth and have resisted interdisciplinary teaching and research, I would not like to see legislation

which lets the fox guard the chicken coop. We should use the environmental issue to force the reform of the universities that is necessary in other areas as well as in the area of the environmental crisis.

This bill should include specific provisions implementing the proposals in the publication "The Universities and Environmental Quality: Commitment to Problem Focused Education" (a report to the president's Environmental Quality Council), prepared by John Steinhart and Stacie Cherniack. This report stresses that effective multidisciplinary problem-focused programs were only successful when the faculty in the program had complete control of the faculty reward structure, course content, and requirements for degrees. This is necessary to prevent the majority of specialists from undermining the creative few who are moving into the vacuum and working between disciplines.

The implementation would be as revolutionary as genuine congressional reform. Funding under this act should be restricted to groups which have the degree of independence suggested in the above report.

[*After his testimony, Mr. De Bell entered into the record an article entitled "Education and Ecology," which he wrote for the* Environmental Handbook. *The Handbook is edited by Mr. De Bell and published by Ballantine/Friends of the Earth.*]

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Mr. Brademas. Thank you very much, Mr. De Bell.

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Student Initiative in San Francisco

Mr. Scheuer. . . . I was a delegate to a UNESCO Conference on Environment in San Francisco a few months back where the students really outperformed everybody else. As a matter of fact, they tried to not let the students' really important motions come to the floor. And I stood up and said, "Look, the students have shown us the way and they are way ahead of us. Let's have them do their 'thing'."

In any event, the Berkeley students played a very constructive role in that UNESCO Conference. I wonder if you could tell us about the role that they played, how they got started, and the potential they offer us in giving just minimum nudging.

Mr. De Bell. I would like to say that I was at the UNESCO Conference and appreciated your support on the floor, and I was there when you did it. As to the way this thing happened at Berkeley, I think I would have to write a book to go into the history of it. But in terms of the educational effort, a long time ago, or approximately four years ago, the students started to pressure the university to get active in ecological education, and we ran into heavy roadblocks and they were unalterably opposed, with the exception of a small number of individuals.

So we took over and started teaching our own ecology course and the enrollment figures, I am sure, were embarrassing to the faculty. Because we took over and we could teach better ecology courses than they could because we understood better.

Mr. Scheuer. Who taught these courses?

Mr. De Bell. I taught one and Mark Lepay taught one, and these were the two biggest ones.

Mr. Scheuer. Were you an undergraduate?

Mr. De Bell. A third-year graduate student, and he was a recent Ph.D. I taught courses through our sort of experimental program called "Center for Participation Education." We cut the enrollment off at 200 on the first day. This was a larger enrollment than for all of the other ecology courses put together. A lot of our students could not get credit for the course, because of the way the university is structured, but we were able to maintain large enrollments throughout the quarter. In my case, half of the students obtained formal credit through means that were actually on the fringe of the rules. It was borderline in the case of the rules, and we tried to cut the line as closely as we could.

Mr. Scheuer. You may want to correct the record to protect the students.

Mr. De Bell. I don't think so. We had read the rules as tightly as we could, and we acted as a corporation would and stayed exactly within the letter of the law.

Mr. Scheuer. But you were clearly within the letter of the law and let the record be clear about that.

Mr. De Bell. Yes; as far as we could. And we are speaking of the university rules, by the way.

What happened is that the university, I guess, finally realized there would be money in it and they started to come along and offer programs now. Some of the faculty members involved in the program have told me they are a little concerned that the establishment will emasculate the thing as soon as they get started, because the people in the faculty are concerned that the people affected will try to effect interdisciplinary education.

Now the most heartening thing is the students educate themselves now, and I think self-education is a lot better than just sitting in a classroom like a sponge and just absorbing all of this stuff. And a lot of the people are locking together ecology with politics, which is . . . necessary. You can't worry about the environment, and how organisms interact with the environment, unless you consider how the political system interacts with it.

. . .

Individual versus Social Action

Mr. Scheuer. Do you see the young people of the country concerned with effective legislation or concerned with somehow or other getting out the message that individual patterns of conduct and individual values also can be changed to help the environment?

Miss Buxbaum gave me the impression that she didn't place much priority on getting out the word that individuals have to change their value structure, have to change their priorities, have to change their whole life style. These changes, in effect, would augment our legislative efforts in controlling the major industrial environmental pollution.

Mr. De Bell. There is sort—well, a lot of people advocate political and a lot of people advocate personal change. I think what I try to make people aware of, and I think

consciousness is starting to emerge, is that both have to happen.

In the area of personal awareness, we have to have an awareness that we have to have a much smaller family size, such as a two-child family. And in the area of supersonic transports, it is strictly a governmental decision. And in order to stop it, we are going to have to get our people politically active, so that in this area it would be a governmental decision, where we try to put political pressure on the people making the decision.

In the area of consumer protection, it can be attacked at the individual level, where we have to try to change our life styles and get our people not to be a market for this stuff and to use the boycott and other means to put companies out of business that are producing this junk.

Now, the other way is to act at the governmental level to try to regulate advertising so that the advertisers will stop doing this advertising on smoking, and so forth, so we should see it going on on both levels.

Mr. Scheuer. Let me interrupt there. I suggest that this is exactly the ideal area in which individual action can be positive and constructive where you, as a member of the American Civil Liberties Union, which I hope you are a member of—

Mr. De Bell. Naturally, I am a liberal.

Mr. Scheuer. You would not hope, I think, to have the government tell a private group what it could or could not advertise for. I would be shocked to have any government tell GE that it could not put out an institutional ad urging people to consume more electricity. I would be shocked not so much as a member of the American Civil Liberties Union's National Board of Attorneys, but as a citizen concerned about the environment. I would do everything I can as a private citizen to make the utility companies know that this is not the way to encourage good public relations among thinking Americans and that it would be unproductive for them to carry on that kind of advertising.

Mr. De Bell. In this area, what I would say is, if an area like the public-utility area, continues to advertise to try to increase power consumption, which they are doing aggressively now, I think they should be made to stop or, if not made to stop, that the people that want to counter their ads should be provided with the revenue necessary or equal time necessary to be able to counter them in advertising, because the utilities constantly produce false advertising.

Take in the area of detergents, they say if you get their detergents you will get clean and shiny dishes. But they don't tell you that you will get crummy rivers. I think they should be forced to include that part of the message or the public should be given equal time.

Mr. Scheuer. Then they may have told the truth, but not the whole truth.

Mr. De Bell. Yes; partial truth, I think, is equivalent to telling a lie.

Mr. Scheuer. Well, maybe this equal-time business is something we should work on.

Mr. De Bell. We are presently pressing that area at the present time.

Mr. Brademas. Thank you very much, Mr. De Bell. I think you have already made a great contribution to our understanding, and I am sure that with the publication of your *Environmental Handbook*, your name will become very well known as one who made a significant contribution in this area. Thank you very much.

. . .

Introduction of Denis Hayes and Bryce Hamilton

Mr. Brademas. Our final two witnesses this morning are Denis Hayes, director of Environmental Action, and Bryce Hamilton, coordinator of High Schools for Environmental Action.

Gentlemen, come forward. We look forward to hearing from you.

Mr. Hayes. Mr. Chairman, thank you very much for inviting us to comment on the proposed Environmental Quality Education Act.

Two critical fallacies permeate the proposed legislation, and serve to undermine its goals.

The first of these is an outrageously antiquated view of "education" as the process of transferring a body of factual information from a source to a receptacle. The second is an inherent assumption that there is a "body of factual information" in existence which contains adequate solutions to our potentially catastrophic ecological condition.

I would like to address each of these briefly, and then make some specific recommendations. . . .

A traditional—and still commonly held view of education—is this: The prime source of knowledge is experience, and man has the ability to "learn," not only from his own personal experience, but also from the experience of others. He can learn from his peers. He can also learn from his ancestors.

In order to efficiently accomplish this process of "education," this learning from others, a series of institutions developed. They were based on two assumptions: (1) younger people, with relatively less experience, would learn from older people, with relatively more experience; (2) the greatest source of knowledge lies in the recorded experience of past generations—frequently alluded to by college deans and commencement speakers as the "accumulated intellectual treasure of Western civilization."

At the point in history when they evolved, our schools probably served their ends reasonably well. But times have changed, and our schools haven't. As a result, the best schools in the country are virtually irrelevant to the real educational process. The typical schools are worse than irrelevant; they are overwhelmingly counterproductive. . . .

The Conservative Nature of Our Schools

What one learned from experience yesterday—let alone last year or last century—may no longer be correct. The situation is no longer identical. And the "facts" accumulated with age serve much more frequently as a mental straitjacket than they do as a source of enlightenment. The most "educational" thing which occurs in most of our schools is the attempt of the students to beat the teacher at his own game. This can be amusing diversion.

It may even be a worthwhile preparation for a congressional aspirant. But it doesn't begin to address the needs of human beings developing in contemporary America.

In a matrix characterized by massive, fundamental change, the principal task accomplished by our schools is the guarantee that succeeding generations will not change in any particularly significant way. From the neat rows of desks to the dress and behavior codes to the "factual, objective, black-and-white examinations," our schools serve to inculcate a generational rigidity which may in the end serve to undo us all. Kids aren't encouraged to grow. They are "contained." Kids don't search for knowledge. They memorize the experience of their forefathers.

By the time they are "ready" for college, they are for the most part unsalvageable. The high school graduate is so bruised, so covered with scar tissue, that he cannot be open to anything. To the extent there may still be a spark of hope, our medieval "institutions of higher education" soon snuff it out. They are, for the most part, far worse than the primary schools and high schools. Professors tend to be narrow, scholarly men, totally at sea outside their minor subareas of specialization. Presidents tend to be distinguished looking fellows who have never done anything sufficiently courageous to make important enemies. Ninety percent of the trustees tend to be the folks who are responsible for 90 percent of our problems.

Education is considered to be units of material, delivered by mediocre teachers, measured in credit hours, and marked at discrete intervals by diplomas and graduation to a new stage. This may have been a valid way to train monks in the time of Thomas Aquinas, but today it serves to crush the very creativity we so desperately need. To the extent that this bill encourages that view of education, to the extent that it strengthens institutions which operate on that set of assumptions, it is contributing more to our problems than to their solutions.

Second, there seems to be an unwritten assumption throughout the text of H.R. 14753 that there is some wondrous body of information which, if only our kids could understand and memorize it, the quality of the nation's environment would be appreciably enhanced. This argument is not totally lacking in merit. But it is almost totally lacking in merit.

Leaving aside for the moment the inner-city schools and the very rural schools—which are so horrifying in their consequences that it would be a genuine charity to the children to burn them down—the failure of the rest of the schools is not a failure to present children with existing quantities of factual information. There is certainly a crying need for sex education, but other than that we do a reasonably good job of providing students with knowledge about what we know.

The State of Present Knowledge

The problem is that we don't know very much. We don't know the answer to the detergent problem. We don't know how to generate power without despoiling our planet. We don't know how to balance our need for food against the menace of pesticides and the environmental horror of sterile one-crop fields and nitrate poisoning.

And where we do know something, we don't know what to do about it. We know the internal-combustion automobile must be banned, that it must be replaced by other transportation systems, primarily mass transit. But we don't know what to do about it. Our railroads do everything they can to discourage passengers. Our auto companies actively discourage meaningful research on alternative transportation systems. Our petroleum companies throw up a protective Madison Avenue smokescreen, almost as thick as the one behind your car. "What can one man do, my friend?"—except howl in anguish as the jingle hums the public to sleep! We have 3,600,000 miles of roads in the country. A mile of road for every square mile of land, and some of your colleagues are still fishing around the old congressional pork barrel for more asphalt.

Our schools aren't telling these kids how to stop those cars, stop those ads, stop those roads. This bill isn't going to tell them. But they're learning.

That thermal inversion over Los Angeles is coming—maybe tomorrow—and tens of thousands of people are going to die. But not one element of the existing order is doing a thing to avoid it. Ten to 15 people die in New York City every day from causes related to the air they breathe. The emphysema mortality rate for the state of California has increased 12 percent a year for each of the past 20 years. And not one element of the existing order is doing anything to stop it.

. . .

Suggested Changes in the Bill: Institutional Recipients, Sex Education, and Student Participation

I would like to suggest a series of alterations in the text of H.R. 14753.

The motives of those who drafted the original bill were undoubtedly good. It is an extremely broad document, which could be interpreted and implemented in a variety of ways—and many of them good. And it is sufficiently vague on particulars that it shouldn't inspire any significant opposition in an election year.

I don't think we can afford that any longer. Considering the way our civil-rights legislation is being sidestepped, I think we must muster the political courage to spell out exactly what we mean in all future legislation—and put an end to this mealy-mouthed political ambiguity.

The purpose of the following suggestions, then, is intended to flesh out the substance of the proposed legislation:

First. Section 3, part 1, lists an encouraging number of potential grantees, including public or private agencies, institutions, or organizations. I would like to see this expanded to read: "public or private agencies, institutions, counterinstitutions, experimental schools, or other organizations."

An unaccredited school called The Soul Academy in Seattle is fighting a freeway proposal which would channel a stream of poisonous vehicles through the heart of that city's minority section. I, for one, contend that these environmental efforts are certainly as deserving of assistance as those of a suburban high school taking field trips to a nearby meadow.

Second. It is difficult to see how any bill can deal with

environmental concerns today without dealing explicitly with sex education. This absence is indicative, I suppose, of the controversial nature of the issue, and of the fact that there is a paucity of women legislators. Nonetheless, I would encourage an explicit reference in section 2, part (b), to the need for education about sex and the population explosion.

As a footnote, I would like to suggest that some significant pressures are going to have to be applied to this sensitive area. I suspect the day is already on the horizon when significant federal funding will be earmarked for sex education and all federal funding will be withheld from schools which refuse to shoulder their share of this social responsibility.

Third. Virtually all of the valuable changes that have occurred in our schools this past decade have been sparked by kids. But students are ignored throughout this proposed legislation. It talks about the commissioner of education, about state education agencies and teachers and committee members, but the word "student" never appears.

Like most pieces of legislation, it has possibilities to be useful, depending upon how it is interpreted and administered after it is enacted. I suspect it will not be worth a tinker's dam unless you build in some very important roles for students. I propose the following:

The present section 4, part (c), should be made part (d), and the new part (c) should read: "(c) Applications from formal educational institutions for financial assistance under this act may be approved by the director only if the institution can demonstrate (1) that students were involved in an integral manner in drafting the proposal and (2) the proposal has been scrutinized and approved by a representative group of students from the affected institutions."

Section 5, part (b) should be amended so as to guarantee that at least one-quarter of the people on the committee at any time are students.

Administration and Financing of the Act

And, finally, I would like to make a rather sweeping recommendation. It is based upon a recognition that the facilitating structure is frequently more important than the intent of legislation. It is further based upon a recognition that the commissioner of education already has plenty of work to administer. It is also based on a recognition that dramatic reform is not accomplished by plugging new legislation into an existing bureaucracy, especially one which is demonstrably tried and demonstrably uncreative.

I urge that the Environmental Quality Education Act be administered by a director, who would be directly responsible to the president's Council on Environmental Quality, but who would be chosen in an untypical way.

The Advisory Committee on Environmental Quality would be appointed, ten members each, by the commissioner of education and the Council on Environmental Quality. And the advisory committee should then select the director, who would also serve as chairman of the advisory committee. The committee members should have alternating, nonrenewable two-year terms, and the director should have a maximum term of four years, subject to yearly review.

Mr. Scheuer. If the members are not renewable, don't you think they ought to be biodegradable?

Mr. Hayes. I believe most people are biodegradable.

A majority of people on the committee at any given time should be associated with educational institutions, accredited or otherwise, and at least one-fourth of the committee members should be students.

The minimum budgeted this first year under the Environmental Quality Act should be $2 billion, not more than five percent of which should be spendable on buildings. A goodly amount of this money should be used in adult education and community education. And much of it should be distributed through the mass media.

It is, of course, the function of Congress to allocate funds and thus determine national priorities. However, my personal preferences as the sources of these $2 billion would be from the cancellation of and reallocation of funds presently earmarked for the SST and the MIRV. Additional revenue would be generated by a one-percent cut in the oil-depletion allowance of every oil company—such as Union and Chevron—which had a disastrous oil leak this year. And any additional funds could be drawn off the budget for the Army Corps of Engineers.

Further, I would urge that a slush fund be established, to be administered by the director of environmental education, into which would be paid all fines collected as federal penalties for illegal polluting. This would result in a couple of benefits. Student groups would be encouraged to actively seek out and report illegal polluters. Also, the attention of at least the educational communities would be focused on the courts to see if realistic fines were being assessed of environmental criminals.

This fund would be distributed by the director to various groups from within the geographical area where the fines were collected, for positive programs of environmental enhancement toward a state of ecological balance. And, if necessary, programs that are funded could be administered also to wage lawsuits against other people defiling the environment.

Some of you may view these proposals as reasonably daring. I view them as timid, pragmatic "seed" proposals. We are in a state of ecological crisis so grave that it militates against our human pride to even admit its desperation. Things are not only getting worse, they are getting worse at an accelerating rate. Our government and our economic institutions have been long on rhetoric but short on remedies.

Far more daring than has thus been evidenced is going to be required if we are to avert the ultimate tragedy. Our institutions have not been responsive to our needs, and they are rapidly losing their credibility. We are running out of time.

We don't have very much more time. We can't afford to give you very much more time.

Thank you.

Student Concern About Environmental Problems

Mr. Brademas. Thank you, Mr. Hayes. . . . Mr. Hamilton, you may proceed.

Mr. Hamilton. Thank you, Mr. Chairman.

As high school coordinator for the April 22 day of national environmental awareness, I am most encouraged by the tremendous interest shown by schools all over the country. I am receiving an average of 200 letters per day requesting assistance in setting up activities and programs. And I estimate that more than 10,000 elementary, junior, and senior high schools will participate in some way.

This large response indicates the serious concern felt by America's youngest citizens about the problems of environmental deterioration. Many are frightened, wondering if they have much of a future to look forward to.

Chuck Karo, age 13, of Port Washington, New York, writes:

> I have read that many experts give us another 50 years before we completely ruin our environment. I feel the need is urgent and give my full support to April 22. What can I do to help?

And Jerry Murphy from Lansdale, Pennsylvania, requests:

> Please send me all the information you have on Earth Day. I am in the fifth grade and would like to organize my community. The teachers and adults of my area are less aware of the urgency of this problem than the children and I would like to help make them aware. I will send some money when I can.

I am glad to see so many thousands of these young people becoming actively and emotionally committed to this issue, because they represent a vast base of social and political power which will soon have to be reckoned with. And as they become aware that the ecological crisis is ultimately a matter of life and death, I think that they will demand that appropriate action be taken, regardless of social and economic costs.

The Need for Changes in Personal Values and Commitments

I am firmly convinced that environmental quality cannot be bought, no matter how much money might eventually be spent. Antilitter campaigns, improved sewage treatment facilities, mandatory smog-control devices on factory stacks and auto exhaust systems are imporant. But these are not more than piecemeal solutions to the problem. If today's young people are to have a future worth living, some very fundamental and radical changes must occur in the social fabric of this nation. Deeply imbedded values and attitudes must be reexamined and updated.

Coleman McCarthy of the *Washington Post* recently said in one of his columns:

> The one thing needed to recover and preserve the American environment is exactly the one thing money, programs, and Presidents cannot instantly effect among the people: a reverence for the earth. This reverence, in its simplest form, means paying fair homage to the soil, the winds, the waters, and honoring the very spirit of their places.

And an editorial in the *Post* a week ago today said: "Americans may have to stop living so well if they wish to stop polluting so much."

The same editorial concludes with the following somber, but I think valid, assessment of the situation:

> Thus the prospects for balancing our ecology are even bleaker than originally suspected. Government policy, court-imposed fines, new technology, the overnight growth of a pollution-control industry—none of these can avert ecological disaster alone; the problem goes beyond politics and technology into the social and psychological parts of Americans. This is what politicians and other leaders should begin talking about: that the environment will not be saved—and ourselves with it—by some kind of vague collective concern. It will be saved—if it is saved—by specific, individual sacrifice of personal comfort and economic growth. This is a dismal thought, perhaps, but easier to live with than the environment we will encounter in good time if we do not face up to it.

Amen! Individual sacrifice of personal comfort and economic growth—this is where it's at. And what disturbs me is that practically no one in government and industry, the centers of power and influence in our society, are addressing themselves to this basic notion. Instead, they are busy counting up how many dollars and how many votes strong antipollution measures would cost them. Meanwhile, the frustration and anger of the young people whose lives are in jeopardy continue to grow.

Bold action and strong leadership are needed on all fronts—government, science, industry, education. Now. There isn't time to wait for a future generation to move into decisionmaking positions. By that time it will be too late.

Making environmental understanding an integral part of our educational system, particularly at the elementary and secondary levels where attitudes are formulated, is, in the long run, the major hope in saving ourselves from ecological disaster. All instruction should be based upon the understanding that man, as a biological animal, is but a thread in the intricate fabric of nature and that his existence on this planet is tenuous and totally dependent upon highly integrated and fragile forces, any one of which, if sufficiently disturbed by man's lack of reverence, could lead to the extinction of all life. Young people must be made sensitive to the fact that our spaceship earth is a finite planet with a finite amount of rapidly diminishing resources, resources which must serve not only our own, but future generations. They must be taught to lead ecologically sound lives.

The whole bit about money and position and material wealth as the goals to shoot for in life must be abolished if we are to have a chance. I recall just a few years ago when I was in high school being told by teachers and counselors that society was very competitive and that to get ahead, land the best jobs, and make the most money, it was imperative that I make good grades. I and many young people today categorically denounce this "get ahead" ethic as anachronistic and terribly dangerous in today's world. The mad pursuit of money and material wealth must be replaced with the desire to live in harmony with nature and to experience the peace of simple natural living. Students should be led to discover their senses, to find the fulfillment that comes from self-expression and individual creativity and music and watching sunsets and sleeping under the stars.

Environmental education goes far beyond the realm of conservation and outdoor education and restructuring biology. It calls for a different life style. To me this is our only hope.

Suggested Changes in the Bill: Population Control, Teacher Education, and Student Activities

The stated aim of H.R. 14753 is "to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance." I think that this goal should be made a national priority. With this in mind, I offer the following suggestions about the bill and environmental education in general.

First, because of importance, the necessity of population control should be fundamental to all environmental education. Without it, the noble idea of ecological balance is unattainable. All young people must be made to realize that it is socially irresponsible to have more than two natural children.

Second, I advocate that a proportionately large share of the funds appropriated for H.R. 14753, if it becomes law, be allocated for teacher education, because they are the key to success for any environmental education program. Until instructors feel the interrelationship of all living things, of which I spoke earlier, until they feel the necessity of changing attitudes and living less affluently, any curriculum materials and programs will be just so many words. As soon as practicable, I think that states should require all teachers K-12, to complete a certain amount of environmental coursework before becoming accredited. Also, a national campaign of evening classes, weekend seminars, and summer workshops should be instituted to train teachers already in the classroom.

Three books brought me a long way toward my current thinking about the environment, and I recommend their widest usage, both in teacher education and in the classroom. They are: Ehrlich's *The Population Bomb*, . . . [the Rienow's] *Moment in the Sun*, and Dubos' *So Human an Animal*.

Third, from past experience I have discovered that one of the best ways to break the barriers of apathy and ignorance is through the use of audiovisual methods. Many excellent films dealing with the various aspects of environmental deterioration are currently available. I recommend that a selected panel choose a dozen of the best films to be reprinted in quantity, highly publicized, and made available free of charge to schools and community groups across the country. Provision for this could perhaps be made by an extension of section 3(a)(5) of this bill.

Fourth, an addition to the bill that I strongly urge is a provision to set up, on a statewide or national basis, a central repository of environmental education information. A lot of excellent material is available today that, unfortunately, very few people are aware of.

Fifth, environmental education should deal, whenever possible, with local environmental problems. Taking a local pollution inventory, researching the problems, and coming up with alternative solutions, for instance, would make the learning process relevant and exciting, something that can rarely be said for most classroom situations today. All students should discover firsthand the operation of water purification and sewage treatment facilities in their communities and should know how solid waste disposal is handled. Equipment should be made available, perhaps through an extension of H.R. 14753, for measuring air and water quality—another example of relevant learning that chemistry students would eagerly enter into. I think, too, that selected students should be allowed to do full-time research, under faculty supervision, of environmental problems. Second-semester seniors, who often have little to do anyway, could personally benefit from independent study and could pull together valuable data for the school, community, or public agencies.

Sixth, the establishment of student ecology clubs should be encouraged. These clubs can serve a vital function in carrying environmental awareness to the community through activities such as ecology fairs, seminars, film-showing, student-edited eco-newsletters, the initiating of consumer boycotts, distribution of petitions, and students themselves speaking before community groups and elementary classes.

Seventh, there has been some talk about establishing an Ecology Corps patterned after the Peace Corps and VISTA ideas. If this does come into being, I think that members could, if adequately trained and motivated, be extremely valuable in promoting environmental education and sensitivity, both in the schools and at the community level. They could research local environmental problems, give speeches and classroom presentations, arrange field trips and pollution tours, coordinate the obtaining and distribution of films and written environmental materials, and serve as catalysts for student and community action to fight environmental deterioration.

Eighth, one final reservation about H.R. 14753: I am a little worried about section 5(b). It states that the 21-member advisory committee "shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer and citizen to his environment and the Nation's ecology." I guess that could include just about anybody. The membership of this group is critical because it will determine the types of programs that get out to the field. I just hope that it is not predominantly comprised of PR types, businessmen, and old-line educators. There is great need in this endeavor for fresh ideas and new approaches, and I hope that ecologists and young people are well represented among its membership.

With the additions and reservations that I have mentioned, I think that H.R. 14753, if adequately funded, can be a significant step forward in the attempt to bring man back into harmony with nature. The harmony I speak of can be achieved only through attitudinal changes, and education is what changes attitudes. I just hope that it is not too late.

Thank you.

Mr. Brademas. Thank you very much, you two gentlemen. Thank you both for your interesting testimony.

Agreement on the Importance of Value Changes

Mr. Hayes, I note in the current issue of *Science* magazine, a publication of the American Association for the Advancement of Science, you were quoted as saying:

> Most of the politicians and businessmen who are jumping on the environmental bandwagon have not had the slightest idea of what they are getting into. They don't realize that we are going to need values.

I daresay that may be the case—and I have not taken a Gallup poll on that issue—but, for your own information and edification, let me tell you that it was precisely because of the conviction on the part of members of this subcommittee and sponsors of this bill, three of whom are here today, that yesterday, when we opened our hearings on this bill, we heard from an outstanding theologian and also from not only one of the leading painters in the United States but one of the most distinguished painters in the world today, Dr. Sittler and Mr. Motherwell, respectively.

Not intending to joust with you but simply to reassure you, I think I do not misrepresent the views of Mr. Scheuer and Mr. Hansen when I say that all three of us feel very strongly in accord with what you suggested—that unless we can help bring about some shift in attitudes toward society and toward human life, . . . we are not going to make much significant headway, no matter what kind of legislation we may produce here. However, it is at least in part to move in that direction that we have put this bill together.

Mr. Hayes. Mr. Chairman, for your information and edification, I received a phone call shortly after that article appeared from Luther Carter, the author, apologizing profusely for the way the quotation got so jumbled in the wire. It is almost impossible to refute an incorrect quotation in a mass circulation magazine when the author doesn't intend to do it, because it happens enough that he does intend it.

The point I wanted to make is this: a great many people are looking for solutions by technological changes to problems which have their roots in misplaced values. We have to create new options, and encourage people to explore them.

In Defense of the Bill

Mr. Brademas. I think we are in complete accord on that point.

Might I also say that while I sympathize with your criticisms of much of the American educational system, I would hope that this modest vessel that we have set afloat into the sea will not be expected to bear the whole burden of reforming and revolutionizing the American educational system. That might be hopeful if we could do it, but I won't want to weigh it down too heavily.

With regard to your statement that the bill is based on the present supposition that "there exists some wondrous body of information," to quote you, "in the field of environmental studies," it is, I think, somewhat exaggerated.

I do think that one of the principal purposes of the bill is, as it says, to encourage the development of new and improved curriculums in this field. I don't think those of us who put it together pretend to be ecologists, nor do we certainly pretend to know exactly what ought to be taught. But we want to give encouragement to finding and developing effective curriculums, and I was struck in that connection by what Mr. Hamilton said to the effect that there, to quote him, "exists a lot of excellent material available today."

I also appreciated some of your specific suggestions, Mr. Hamilton, in connection with ways in which we might change the bill, your strong emphasis on teacher education and using audio-visual methods to establish a student ecology club or clubs.

Status of Student Interest and Ecology Clubs

Can you tell me, in your judgment, if you have been able to build across the country some kind of network, either at high school or college level, of ecology clubs? Are these aborting at this point in time, or how do we stand in this respect?

Mr. Hamilton. At the high school level it is growing at a great pace. A lot of groups are organizing to plan programs for April 22. These groups are being set up as ongoing ecology clubs in the schools.

Mr. Brademas. What do you think, Mr. Hayes, is going to happen after the 22nd of April? Will this be a one-shot expression of student interest in this matter and then they will quietly fold their tents and go back home and we will hear nothing much more about it? Or do you think that the commitment to concern themselves about environment is profound and wide enough among university students that there will be significant followthrough after April 22?

Mr. Hayes. To address myself briefly to both questions, Mr. Chairman, I guess one might term the groups that are forming in colleges and in community "ecology clubs"—a lot of them are concerned with something a bit more specific than that name tends to imply. They are conducting investigations of those people and institutions contributing to the degradation of life.

I think such groups are providing, in educational institutions and in the mainstream of society, some kind of a point around which other people can rally. They are going to be doing the basic organizing, the "busy work" of getting things off of the ground. But the range of concern extends far beyond the parameters of these existing organizations.

The second question about this being a one-shot deal, is the question I most frequently encounter. It seems to be on the lips of every reporter. The media tend to go on the basis of fashion, something is fashionable one period and then something else in another period, and what is fashionable gets covered.

There is thus a presumption on the part of a great many people that student interest over civil rights and civil liberties and equality of education has died out. That is wrong. If you look into the real records of what is occurring on campuses, not what is published in newspapers, but rather at the number of disturbances which took place in the last four months, I think you would be amazed. If this had occurred year before last, it was front-page news

at least once a week, but this year it is not the fashionable thing. So the students and their concerns are ignored.

The same thing can be said for the war. A lot of kids are sufficiently frustrated and disenchanted with bringing about meaningful changes in the context of the existing order that they have given up the kinds of activities they had been doing before. Now they sit around coffeeshops and around their own homes, sort of discussing their inability to have an impact on that range of decisions. The issue, however, has not been dropped.

With regard to the environment, I think that the probabilities of this being a fad are even less than they are with those two issues. This can't be a fad, because, as I remarked, I think, at once place in the text, things are not only getting worse but are doing so at an accelerated rate. We have catastrophe after catastrophe after catastrophe, and the people that are going to be the prime losers in that set of occurrences are going to be the young, the people who want to live in this country 30 years from now, but find themselves with the prospect of facing an uninhabitable planet.

Emotions are running high. Just take the kind of advertising that is coming out. You see full-page glossy ads which are absolutely disgusting in the way they deceive people. That money could be invested in something which would be a bit more useful in terms of enhancing the quality of the environment, not just the beauty of some of the pictorial magazines.

We have seen little indication that society is beginning to recognize the error of its ways and to begin to turn around.

In brief, this is not a fad. The 22nd is a beginning for us as an organization and, I think, a beginning for the youth of the country, not just students, but the youth of the country, as the environment as a significant issue.

Mr. Brademas. I am very encouraged to hear that response, and I am impressed by what both of you have said in respect to the importance of our seeking to shift values in this country if we are going to make some substantial advance in keeping with this problem.

Thank you very much, Mr. Hansen.

Further Defense of the Bill

Mr. Hansen. Mr. Chairman, thank you. I thank both of you for very pointed statements. I have just a couple of questions I would try to direct toward the principal criticisms in the matter of the bill. I believe you characterized one as embodying a hopelessly outmoded, archaic concept of an educational system. And I am wondering, with all of the very constructive suggestions you made for changes in the bill, if, in your judgment, this really corrects the major defects that are there.

Mr. Hayes. If the rather sweeping suggestions I made at the end of my statement about the fundamental reorganization of who is to administer the bill, and the appropriate level of funding, and the kinds of institutions that would be the beneficiaries could be adopted, I think it would cause an enormous change for the better in the existing educational system. I think it would be enormously beneficial. My concern is that it will either be inadequately funded, or the money will go to the wrong institutions.

Mr. Hansen. My second question relates to the other criticism directed toward the bill. And that is, I believe you described it as:

"We don't really know enough, and the bill assumes we have a great body of knowledge."

I think when we try to develop a new program such as this, we are faced with this question: Do we know enough? Should we wait until we learn more before we make a beginning?

I would readily concede there is a great deal to learn. But, we know a great deal and a lot of it is really not too complicated. We know a lot about the earth. We know about nature. We know that pollution kills life, and we know what causes pollution, and we know many of the effects of pollution.

I was very much impressed by Miss Buxbaum's description of her experience in Nevada this past summer. And I was impressed with the amount she had learned, which will [be] put to very good use throughout a career which she has chosen for herself.

Now my question is, really, don't we know enough that we can't afford not to wait to disseminate the knowledge that we do have and in trying to learn as we are moving forward with programs such as are envisioned by this bill?

Education as an Organic Experience

Mr. Hayes. Yes.

The point I am trying to make is not that the body of information where we do have some tentative conclusions should not be presented for analysis in the classroom, but rather that the fundamental process of education is an organic experience. The individual, by going out and experimenting and making mistakes and coming into direct contact with a series of situations, adopts a set of mental ideas, attitudes, shifts of beliefs in values, which become the most critical elements in his total life style. The adoption of a given body of material, which is simply the memorization of facts, such as the facts about earth or the facts about war, constitute a reasonably unimportant part of the behavioral mechanisms. And in most cases people tend to forget rapidly.

I went through quantitative analysis and chemistry, and I have forgotten 98 percent of the equations I learned. Most of my formal education has had little impact on my values, or on the way I lead my life. My fear for the bill is that it seems aimed too much at academic ends, and too little at living educational ends.

The bill might act to set up new departments in existing institutions, but what we really need is a new set of institutions. Many of our most important educational institutions—the family, the church—are losing their impact, and nothing is replacing them.

That is what we call for, for a list of institutions to receive funds for a new era of education, an organic, growing kind of education, as opposed to an information-transfer kind of academic training.

. . .

The Need for Community Involvement

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer. I want to thank you both for your remarkable and stimulating testimony. I could question you for the rest of the day on it, which I assure you I won't do. But it has been an intellectual pleasure to listen to both of you.

Now, because of the time—and we are functioning illegally now, because we are not supposed to hold hearings after the noon bell has rung—

Mr. Brademas. Unless it is made a point of order.

Mr. Scheuer. Unless it is made a point of order.

The thing that concerns me about the whole effort of the environment is the lack of community and political followup. I was at that UNESCO conference that Mr. De Bell discussed before. And before I went, I circulated a draft of this bill which we were developing to everybody who participated in that conference. And I got all kinds of suggestions out there regarding the technical aspects of the legislation, but not one suggestion that we should make a reference in the bill to community and civic action, involving the churches.

I don't know whether I caught you correctly when you talked about the churches collapsing. But in my view, I can't remember a time when the churches were going through a more agonizing effort to be relevant than they are now. I would like nothing more than for this bill to provide that churches can get some funding for community education and action programs in the environment.

This morning I have been sitting here somewhat disturbed. No one talked about what we are going to do about what we do know. And I agree wholeheartedly with Congressman Hansen that, while we don't know it all, we know enough to begin to apply in the world some of what we know.

It seems to me that if this message should come from anybody, it should come from the activists, who ought to be distressed that, while we don't know it all, we are not beginning to apply what we do know.

Would you have some suggestion to us as to whom we can fund for some legitimate, constructive action programs? And, of course, they would have to be nonpartisan or bipartisan. They couldn't be political; but there certainly could be community action programs to identify and bring public pressure on polluters, to investigate every aspect of the impact on the environment of both government and private sector programs.

Would either of you have suggestions how this bill could stimulate action or result . . . [in] programs which are civic and community—and neighborhood—oriented?

Mr. Hayes. There seems to be a little confusion in terminology. I think you were involved in a couple of conversations during my testimony, and that might be the root. The prime thrust of what I said was, that so long as we viewed the educational process which takes place with regard to environmental concerns as one which transfers information between teachers and students, then we are still only talking about a solution being 12 years in the future for a problem that should have been solved a decade ago. That won't do. We have to involve society now! We need a different range of institutions than what the bill addresses itself to.

I gave a range of other possibilities. They include things such as counter institutions, such as free schools. I don't know if you are familiar with what that term implies, but they are what you called "civil-social action groups." They are concerned with the grass roots. An organization in Palo Alto is trying to build a coalition of rich conservationists, low-cost housing people, people concerned with the establishment of a military research park on university lands. All have a central purpose of challenging the way that Stanford University had invested in its lands. They are saying to the university:

"You have one basic resource. You are the biggest land holder in the area, and you should serve the interests of society. We would suggest, instead of going ahead with your intended development, that you adopt this counterproposal."

That is the kind of thing that is occurring across the nation, but which is in dire need of money. Now, this can be overdone. There is nothing you can do to a student organization that would be more disastrous than to give it, for example, $100,000 for a project costing $5,000.

Mr. Scheuer. Well, if they don't have the money to pay the people to do the organizing, that would hurt.

Mr. Hayes. Well, they should at least have a mimeographing machine. And in case after case they have completely stopped because they were unable to get a few dollars here and there. With our organization presently involved in environmental action, I think we are doing something which is going to have as profound impact on this society as anything that occurs this year.

I can think of nothing more critical than to bring to the people the kinds of programs we are trying to get across. We don't have money. We are several thousand dollars in debt, and I don't see any grants on the horizon. This kind of program—which does not involve major universities or state school systems, not established ways of dealing with things through normally established mechanisms, but imply the ones we are making today—simply does not "qualify" in the eyes of those who have money.

Administration of the Act

With particular regard to funding, I would like to urge that your program not be administered by a commissioner of education or the department of education. Once you do that, you are plugging everything into a whole system which does not function. You have to create something new, and I think the ideal place is something underneath the Council on Environmental Quality.

Mr. Scheuer. Well, let me put my question mark after that. Normally, in this bureaucratic area, which we call Washington, D.C., when a fellow gets a title and an office and a phone and a secretary, he then carves out as big a hunk of turf as he can for himself. This is the bureaucratic warfare that goes on. And if a fellow wants to be effective, he carves out his turf and then starts planting seeds.

One of the first things the chairman of the Environmental Council said was that he didn't know what his

jurisdiction was, he didn't know where his jurisdiction and the executive branch's ended or started. And he thought it would take months, if not years, for people to figure that out. And it gave me a lack of confidence that he was really in there to fight for a place in the sun for the environmental concern. And in the executive department, where we have a Defense Department, an Agriculture Department, a Commerce Department, HEW, and Labor, where we desperately need an agency that will provide some kind of oversight, the chairman seems to be wondering where to start now. And if you are looking for somebody to challenge the institutions, I don't have any evidence before me up to this time that such leadership is presently residing in the Environmental Council.

Mr. Hayes. I do not want to get involved in any question of personalities. I think probably what would be desirable would be to bring in a new personality who, in terms of a bureaucratic structure, would be subordinate to the structure but will largely not have to answer to it. I think there should be young people definitely involved who are able to relate to other young people where they are, the younger people under 30 in this country, whether he is under 30 or not.

As far as having this office under the Office of Education, all of you now involved in this committee know it is one gigantic SNAFU. It would take several years to try to carve any autonomy out for something within OE, if indeed it would be possible at all.

There has to be a noninstitutionalized way of proceeding with these matters. It is necessary that you don't build a perpetuating mechanism into the system. Whenever we have a fellow who is primarily concerned with maintaining his job, then we have trouble on our hands.

Mr. Brademas. Thank you both, once again, on behalf of all of us. And we wish you well in your Teach-in on the 22nd of April.

Now the subcommittee is adjourned until 9:30 tomorrow morning, when we will meet in room 2261. . . .

(Whereupon, at 12:30 p.m. the subcommittee recessed, to reconvene at 9:30 a.m. on Thursday, March 26, 1970.)

DAY 3

House of Representatives, Select Subcommittee on Education
Washington, D.C.

Thursday, March 26, 1970

The subcommittee heard testimony from two university educators and a conservationist on the third day of hearings. The educators stressed the importance of and barriers to multidisciplinary study of the environment. The difficulties of changing ingrained institutions during times of social turmoil were also pointed out.

As an illustration of a promising avenue of institutional change, Edward Weidner described the program at the University of Wisconsin at Green Bay (UWGB), of which he is chancellor. From its inception, UWGB consciously focused "all of its parts on problems of the environment" in an attempt to break loose from traditional disciplinary organization and thought.

Clay Schoenfeld explained the difference between traditional conservation education and the new environmental education. Environmental education is more comprehensive and less fragmented than conservation education; it is man centered rather than resource centered; and it includes urban problems, unlike conservation education, which has traditionally focused on wilderness and rural areas. Schoenfeld also discussed the variety of target groups to be educated and advocated a simultaneous "attack" on all these fronts through the establishment of Regional Environmental Education Centers based on the agricultural extension model.

Matthew J. Brennan made a number of very specific suggestions on the bill's language, budget, and implementation procedures. He particularly emphasized the need to take an inventory of the multitude of environmental education materials, such as those produced under ESEA Title III, which are already available in this country, but are presently widely dispersed and inaccessible.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act. . . .

Introduction of Edward W. Weidner, Chancellor, University of Wisconsin at Green Bay

The Chair would like to recognize a distinguished member of the subcommittee, the gentleman from Wisconsin, Mr. Steiger, to present the first witness.

Mr. Steiger. Thank you, Mr. Chairman. I am particularly delighted to have the chancellor of the University of Wisconsin at Green Bay here. Chancellor Weidner achieved, I think, both for himself and the institution, in a very brief amount of time, a nationwide reputation for concepts that he discusses in his statement.

Mr. Brademas. Come right ahead, Chancellor; we look forward to hearing from you, sir.

Mr. Weidner. Mr. Congressman and Chairman. . . .

We have all been alerted in recent months to the problems of our environment. . . .

Few, if any of us . . . can have any accurate concept of the effort, the ingenuity, the determination, and the cost that will be required to translate this awareness into effective action in support of environmental quality. The reason is that we are dealing with a situation that requires us to abandon or substantially modify certain attitudes and beliefs that have been a part of our conventional wisdom for generations, even for centuries. To mention a single and extremely troublesome example, there is the problem of population control. You are all familiar with its ramifications. They feed into every area of our lives, including the most personal. If basic changes in our individual and societal attitudes in this area are to be made, we face an educational task that dwarfs anything we have accomplished in the past. The size of the task is amplified by the limited time we have to accomplish it.

The Interrelatedness of Major Human Problems

While population control may be the single most difficult problem we must face in the immediate future, there are others that are not far behind it in magnitude and complexity. Some problems, such as war and poverty, are very old and may not at first glance appear to be environmentally relevant. But we are beginning to see such social phenomena in a new context, as contributing to and being affected by ecological factors.

Conceivably, this new way of viewing our situation could lead us to solutions not apparent before. The ecological view does reveal the inescapable relatedness of all of us with each other and of man and his works as a whole with the biophysical environment that produces and sustains life.

In this formulation, you will recognize overtones of the great religious and philosophical concepts that form the heart of our cultural heritage. We are not discovering new truths about the requirements of our existence, except perhaps in a technological sense. But we are rediscovering with great urgency that application of the old truths to the realities of our environmental situation may quite literally be the price of our survival. Because this discovery seems to be taking place on a national and even on a world basis, I am convinced that we are entering on what will prove to be the most hopeful and creative of the ages of man.

A University Devoted to Environmental Quality

Let us now turn from general philosophy to specific example. What are we trying to do at the University of Wisconsin—Green Bay? Our mission at Green Bay is nothing less than to create a new kind of educational institution, a university designed specifically to respond to the needs of an area which will have as its dominant concern the preservation and improvement of environmental quality for all men.

Institutions are essential to the carrying on of our societal business. But institutions, including those devoted to higher education, can lose touch with the times. They tend to continue to respond to the needs for which they were originally created, even after those needs have disappeared or become substantially modified.

When institutions get too far out of tune with current needs, they may steadily decline, or they may renew themselves. In either event, a rather violent and painful social process is involved. That is exactly the process into which our institutions of higher education have been plunged in recent years.

For the most part it has been the students who have forced them into this process, because it was the students who were the first to see that the education they were being offered was only marginally consonant with the great needs of the world in which they were about to become responsible citizens.

A consistent theme during these past few years of campus turbulence has been the student demand for relevance—relevance of what is taught in the classroom and laboratory to what is going on in the rest of society.

I have already referred to the University of Wisconsin—Green Bay as a new kind of educational institution. It may be the only university in the country to be planned from its inception as an institution consciously focusing in all of its parts on problems of the environment. Although our academic plan with its pervasive ecological emphasis became operative only last fall, its formulation began three years earlier, long before the public at large had been made aware of the seriousness of the ecological crisis.

I mention this fact simply to emphasize that our plan is not a patchwork strategy thrown together in hasty response to a popular outcry for doing something about the environment. Naturally we welcome the outcry and the concern that motivates it, but, had it not occurred at this particular time, we would still have been embarked on precisely the course we are now following.

Obviously there was a certain amount of foresight involved in our planning, but it was foresight for which no single individual or small group of individuals can take credit. Our plan, which is still evolving, represents the collective contribution of hundreds of persons, including not only educators and scholars from throughout the country, but many of the business and professional men, political leaders, and other citizens of Wisconsin and its neighboring states—and, of course, our students as well. Full credit must go, also, to University of Wisconsin President Fred Harvey Harrington and his staff at Madison, to the board of regents of the University of Wisconsin, to the state's coordinating council for higher education, and to the legislature for their collective willingness to consider, approve, and fund a new institution that departs radically from the established patterns of public higher education.

The University of Wisconsin-Green Bay Plan

The details of our academic plan and institutional organization are adequately described in a number of appendices which I am submitting as a part of the formal

record of my appearance before your committee. These appendices include a statement of philosophy—exhibit A; summary of the University of Wisconsin: Green Bay academic plan—exhibit B; . . . and a brief description of our colleges and the curriculum concentrations, which are environmental problem areas, for which each of them is responsible—exhibit D.

These documents constitute an expression of institutional purpose that is attracting considerable interest in the media and among other colleges and universities that are seriously concerned with their own possible responses to problems of the environment.

Mr. Chairman, the experience of the University of Wisconsin—Green Bay the last four years clearly indicates that the objectives you seek through H.R. 14753 are both urgent and attainable. Ours is a university with all its curriculums designed to encourage preserving and enhancing environmental quality and ecological balance. Our objective is not to train narrow specialists but to extend a broad, general education on environmental quality to all students, regardless of their fields of specialization or their professions.

In order to attain this end, certain requisites are evident. First, fundamental to our program at the University of Wisconsin—Green Bay is the conviction that our mission can be accomplished only in concert with the people of our region as they act throught their business and industrial enterprises, professional organizations, and governmental and voluntary agencies.

We have already established a variety of community advisory committees that regularly provide counsel and stimulation for our several colleges and campuses and for the university as a whole. The community joins us on the campus, and we of the campus join the rest of the community off the campus in mutual learning experiences.

Second, environmental problems do not recognize political boundaries. Most such problems may be local in origin, but they affect entire regions that are defined in part by natural features and in part by man-made features.

Our region is the upper Great Lakes area. We see ourselves as being in a position to play a unique role in focusing the attention and the efforts of students, professors, and other citizens on environmental problems that are regional and even superregional in extent. This regional role may well be a prototype for other institutions.

Third, the ecological crisis is not one that has been brought on primarily by lack of scientific and technological knowledge. The crisis is rooted in attitudes that have allowed all of us, in our business, industrial, domestic, and recreational activities, to do things that have had a cumulative and massive degrading effect on our environment.

The great need is for a new set of attitudes that will enable us cooperatively to apply to the improvements of the environment the scientific and technological knowledge that is available to us. This is the objective of the general education element of our university work.

Fourth, there is widespread recognition today that the traditional organization of educational institutions into narrow disciplinary departments is not well suited for mounting an educational effort directed to the solution of environmental problems. It is much easier, however, to recognize these organizational defects than to change them. There is a relearning process involved for virtually all faculty members, most of whom have themselves been trained rigorously within particular disciplines and have become accustomed to functioning within traditional departments.

Undoubtedly, this relearning process can best be carried out in a new institution that has deliberately structured itself along lines that encourage the intermingling of disciplines within relatively broad environmental problem areas. For that reason, I would think it particularly important to direct support to universities that are in a position to address themselves to an institution-wide approach to ecological studies.

Let me conclude by emphasizing that the theme of man and his environment is not a fad for a university. It is not a fancy "add-on" to permit an institution to appear contemporary or to assist in attracting outside funds.

Rather, man and his environment must take its place as a fundamental aspect of the curriculum of every university that seriously concerns itself with the future of mankind.

(The documents referred to follow:)

EXHIBIT A.—A STATEMENT OF PHILOSOPHY

(Excerpt from the 1970-71 catalog of the University of Wisconsin-Green Bay)

Meeting the challenge of a new generation of youth who will not be denied less than they have been encouraged to dream: this is the task that The University of Wisconsin-Green Bay has set out to accomplish.

Proceeding from the beliefs that a university cannot operate in a vacuum and that to be alive and effective it must demonstrate imaginative leadership, UWGB has implemented an academic plan that relates the student to the modern world, a plan that attempts to combine the world of books and experiences in such a way as to make the student feel his wholeness—feel that what he is learning and what he is doing have a unity and integrity validating their relevancy.

The contemporary student

The plan begins with certain assumptions about the contemporary student. First of all, he is more capable, brighter, possessed of more knowledge, and the product of a better educational system than the students of his parents' day. His advantages do not stop with higher scores on intelligence and achievement tests. He is both more cosmopolitan and more concerned with normal values.

He has been raised in a society of shrinking dimensions, of instantaneous communication, and rapid world-wide travel. The isolationism of his parents' day is anachronistic to him. He has studied about many nationalisms, competing economic and political systems, and religious, racial, and ethnic groups. If nothing else, he has seen it all on television, read about it in newspapers and news magazines

He has reacted negatively to the kind of education offered on some campuses. He sees faculty members as not interested in and often avoiding the things that he feels are relevant. He wants to participate in the larger community at the same time that he is receiving an education at the university. Frequently his efforts have been greeted with skepticism. Perhaps in part as a result of frustration, he has turned on faculty members and members of the larger community and has charged them with being uninterested in the major problems of the day. On occasion, he has suggested that traditional university and community concerns are outmoded in the new society that needs to be created.

In shaping an academic plan for the new university which first opened its doors as a degree-granting institution in the fall of 1969, the UWGB faculty and administration took up the challenge of the contemporary student. They began questioning established modes of behavior and traditional approaches to university education. They wished to relate university education to the world of today and tomorrow, without turning their backs to the lessons of the past. They recognized that, if action were not taken soon, society seemed destined for an intensification of intellectual isolationism on the part of the university, a cultural parochialism on the part of the larger community, and an oppressive approach to ideas on the part of both.

. . .

Guidelines for an academic plan

This basic philosophy guided the formulation of the UWGB academic plan. Its principles and objectives are designed to facilitate a close interweaving of university and community. The most important bases of this academic plan are:

1. *Devotion to excellence.*—The road to social improvement and social survival necessitates tapping the spiritual, intellectual, and physical resources of human beings far more fully than has been the case in the past. The goal of excellence is for all members of society, not just for the few directly associated with universities.

2. *Commitment and dedication.*—These are not simple concepts. They also involve sacrifice, discipline, a freedom from restraint, and an expansive or experimental spirit.

3. *Involvement.*—Each individual and group must be involved in the process of education. The curricula in higher education should not be as prescribed as they have been. They should be flexible and should extensively involve each student in developing his own curriculum in his own way. The same principle extends to the large community. All elements of society should be involved in considering the need for broader social change and undertake it.

4. *Accessibility.*—To be effective, this means a thorough and continuing two-way dialogue between and among students, faculty, and administration.

5. *Relevance.*—A crucial additional dimension is added to academic experience by relating higher educaton to today's society. As Chancellor Weidner puts it, "Liberal arts education has often been too general. It has been all things to all people. It often has ignored cultural differences. It has frequently been aloof from the world. On the other hand, applied or professional education has often been nuts and bolts oriented, concerned with routine and detailed procedures or methods.

"Those seeking a relevant education have attacked both the traditional liberal arts and traditional professional education. Yet the criticism has often gone too far. Those emphasizing relevance have sometimes suggested that history can be ignored, that anything that is not contemporary is not relevant.

"This is patently false. Nearly all subjects in a university's curriculum can be made relevant to today's problems. Certainly history, philosophy and literature can contribute as much to our understanding of the world as chemistry, biology, or economics. They can be made relevant, but they are not necessarily so without conscious adaptation or effort.

"Faculty members and students must cooperate in designing approaches to such subjects with relevance in mind. A university education that is relevant can result in far higher student motivation. It can result in far more understandable relationships among the several disciplines. It can help bridge the gap between the university and the outside world. It can lend a new element of excitement and meaning to higher education. But relevance does not mean putting aside everything that is not contemporary."

6. *Devotion to problem-solving.*—Sharpening the student's thought processes and helping him examine his values are basic responsibilities of a university. But liberating the student's spirit is fruitless and even dangerous if at the same time the problems brought into focus by values and thought processes are not grasped more effectively. The relevant curriculum heightens the meaning of higher education by leading to a renewed emphasis on problem-solving and creating a habit of mind that is usefully extended to the community at large.

. . .

A FOCUS ON ECOLOGY

From this philosophy and these convictions has grown the special focus of the UWGB academic plan: a focus on ecology, or the study of man in relation to his surroundings. Such an approach to knowledge becomes urgent in the face of the increasing complexity of unsolved problems of the physical and social environment.

The situations comprising our environmental crises are headlined daily: problems of urbanization, racial crisis, population explosion, the cold—and hot—wars, crisis of transportation, effects of automation, crisis of environmental pollution, failing supplies of food and water, and the rapid depletion of fossil fuels.

These problems have been compounded by feedback from attempts to solve one or another of them unilaterally. For example, just when biological productivity must be enhanced, biocides threaten to disrupt the biosphere. Just when plans mature to modify weather processes, it is discovered that air pollution has already set in motion widespread inadvertent weather modification, the consequences of which can now be only dimly perceived.

Because these crises stem from man's relation to and use of his environment, from interactions among men, and from man's perception of his place in the biosphere, they are all aspects really of the ecological crisis. Solutions must be found through the effective cooperation of society's major agencies including the university. The university, in fact, has leadership responsibility in this effort. . . .

An ecological focus demands an interdisciplinary—indeed, a pan-disciplinary—focus. Artificial boundaries of disciplines restrict rather than enhance understanding of the several environments of man. The study of any type of environment intersects many disciplines and involves all branches of knowledge—the physical, biological, and behavioral sciences and the humanities. Ecology is a focus that is broadening and liberating in its educational thrust, not specializing or restrictive. . . .

EXHIBIT B.—SUMMARY OF ORGANIZATION AND UNDERGRADUATE PROGRAM, THE UNIVERSITY OF WISCONSIN-GREEN BAY

ACADEMIC ORGANIZATION

. . .

The academic plan of UWGB stresses the importance of a student's commitment to and involvement in the world with a concern for society and its constructive improvement. The academic program has as its special focus *ecology*—the relationship between man and his physical, biological, and social environment. Study of the Northern Great Lakes is especially stressed, along with comparisons to other areas or regions.

The college structure within UWGB is based on environmental themes and each theme college includes those faculty members and students interested in the respective thesis, regardless of their disciplinary affiliations. Thus, rather than college names which are composite identifications of a group of academic disciplines (e.g. Arts and Sciences), at UWGB college names reflect environmental themes:

1. *The College of Environmental Sciences.*—The foci here are problems and challenges in environmental control (i.e. man's attempt to change his resources or bio-physical environment) and analysis of ecosystems (i.e. man-environment interchange). Water, air, soil, and flora and fauna are of special concern.

2. *The College of Community Sciences.*—This college emphasizes the processes by which man relates to his social environment (community) and undertakes to make it accommodate to his purposes. Approaches to an understanding of social environment are made through study of crucial regional and urban problems and the processes of modernization and change.

3. *The College of Human Biology.*—The central focus here is human adaptability. Human adjustment to the impingement of physical and social environments—our physical, mental, and social health and well-being—is stressed. Aspects of human adaptability given special attention are its theory, human growth and development, human performance, nutritional science, and population dynamics.

4. *The College of Creative Communication.*—Human identity is the central concern of this college. In a way it is a companion college to Human Biology. The latter focuses on the environment's impact on the individual. CCC focuses on the individual's impact on the environment. In order to find and assert his identity, an individual must perform the evaluative function of analysis-synthesis (creativity) and the outreach function of communication-action. The college's two concentrations parallel these functions.

Each theme college has the responsibility for teaching, research, and public service programs relative to its special environmental concern. Each offers work in appropriate liberal arts and sciences disciplines as well as courses specifically tailored to its environmental focus. All disciplinary courses specially emphasize the subject's relevance to environmental problems. Interdisciplinary courses are frequent.

The School of Professional Studies

This School complements the theme colleges and is not analogous to them. It is responsible for professional programs that relate to all or nearly all the theme colleges. Undergraduate majors in business and public administration are available through SPS. However, even in this instance a theme college must be selected in which special work is undertaken in regard to man's environmental problems. Business and public administration are fields that can contribute much to the alleviation of such problems. . . .

EXHIBIT D.—SUMMARY DESCRIPTIONS OF THE FOUR THEME COLLEGES OF THE UNIVERSITY OF WISCONSIN-GREEN BAY AND OF THE CURRICULUM CONCENTRATIONS FOR WHICH EACH IS RESPONSIBLE

The College of Environmenal Sciences is concerned with development of the concept of ecosystems. It seeks to establish an understanding of the exchange of materials and energy between living organisms and their physical and chemical environment, of the use and management of natural resources, and of alterations of ecosystems due to air, water, and soil pollution. The College administers the following concentrations:

1. The concentration in Environmental Control is concerned with the problems of pollution from human and industrial wastes; the conservation of resources such as fossil fuels, minerals, and wildlife; the conflict of interests arising from multiple use of resources.

2. The concentration in Ecosystem Analysis is concerned with study of the effects of man's interventions in the dynamics of the ecosystem. Students begin, of course, with a study of the dynamics themselves—the flows and transactions of energy and materials in the ecosystem.

The College of Human Biology has as its central concern the problem of human adaptability to environmental stresses—physical, chemical, biological and mental. It seeks to prepare students capable of investigating man within the framework of his total environment. The College administers the following concentrations:

1. The concentration in Human Development is concerned with both the physical and mental aspects of human growth and development, and the effect of environment on human development at different stages of life.

2. The concentration in Human Adaptability encompasses studies of man within the context of his total environment, with particular attention to the effects on man of environmental changes.

3. The concentration in Population Dynamics is concerned with the solution of problems stemming from the current tremendous growth rate of human populations.

The College of Community Sciences focuses upon the role of man in the social environment and the processes by which he modifies that environment. It administers the following concentrations:

1. The concentration in Regional Analysis examines the economic, political, and social interactions of people within the context of a geographic region. It places special emphasis on the Northern Great Lakes Region.

2. The concentration in Urban Analysis examines the economic, political, and social interactions of people within metropolitan areas.

3. The concentration in Modernization Processes is concerned with changes in the cultural environment in the direction of modernity. It examines those economic, political, and social factors that bring about changes in the essential values of the communities within which men live.

The College of Creative Communication is concerned with human identity and the cultural environment. It seeks particularly to establish a coherence among the scientific, technological, social and artistic elements of that environment. The College administers the following concentrations:

1. The concentration in Analysis-Synthesis is concerned with the substance and formation of the value structure through which each person expresses his individuality.

2. The concentration in Communication-Action examines the processes by which human beings create reflections of themselves and others and by which they communicate with each other through these creations, and seek to modify their external environment.

Note: Few if any of the above concentrations are taught exclusively within the colleges which have administrative responsibility for them. Courses related to a given concentration are usually found in more than one college. All concentrations are pandisciplinary. In addition to the four theme colleges, there is a School of Professional Studies which offers collateral programs both professional and pre-professional in nature, supplementing the concentrations in the theme colleges.

Environmental Programs at Other Universities

Mr. Brademas. Thank you very much, Chancellor Weidner. At the outset, let me say that which will not astonish you, one of the reasons we were anxious to hear from you . . . is that the University of Wisconsin at Green Bay has already, in its short existence, established certain reputations for pioneering in this field, and we want to learn from you something of what you have found in seeking to establish a university on an environmental base, as it were.

One of the questions I would put to you is this: To what extent is your example being replicated across the country? Are you unique or are there similar efforts going on elsewhere?

Mr. Weidner. Mr. Chairman, I believe that we are unique in one sense. We are unique in the sense that we are a new institution which developed a concept of man and his environment for the entire institution. We are not unique in talking about man and his environment, but it is much easier in an established institution to add on, to add on a few courses, or to add on a particular experimental college, as some institutions have done. It is difficult at an established institution to change the entire curriculum.

If I might expand upon your question, general education is a kind of education which is thought desirable for all undergraduate students, no matter what their discipline and no matter what their profession, and general education traditionally in this country has been devoted to certain kinds of things, written and spoken English being a very good example, American studies, and very much in the 1950s and 1960s, I think very much with encouragement of men such as you, Mr. Chairman, international education became an element in general education.

But I know of no institution which has developed a theme of man and his environment in its general education

package other than our own institution. There probably are some but I don't know of any, and it is not very common.

There is another element to this, however, if you put it into a general education package along with international education and written and spoken English and so on; there is still a traditional possibility of relating it . . . [to] each of the majors with[in] an institution.

For example, if a student is majoring in secondary or elementary education, isn't it reasonable, isn't it urgent that that student understand something about man and his environment as applied to secondary or elementary education? Isn't it urgent that that individual know the kind of projects that he or she might carry out within a public or private school context?

If a person is going to be an engineer, isn't it important that he understand the role of engineering in regard to environment? If a person is going to be a lawyer, chemist, artist, or whatever, I think it is equally important that each of these disciplines, fields of study, or professions apply themselves to problems of the environment, give students inspiration, give students practice in this kind of application.

I think it is important for the future of our country and the world; I think it is also a good education theory because it immediately gives the student motivation.

I have wandered, in response to your question, but to come back to the gist of it, Mr. Chairman, let me say there are a number of institutions which have added courses, which have added institutes; there are a few of the experimental colleges that are focusing upon this; but there are all too few, almost no institutions that have applied this systematically to their general education and then taken a step further to apply it to each of the disciplines or fields or professions.

Establishing Environmental Programs in Existing Universities

Mr. Brademas. You express in your statement a certain degree of skepticism, as I read you, about the prospect for existing colleges and universities, structured as they are around the various academic disciplines, for being able to achieve the kind of multidisciplinary approach that you indicate is essential, and in this respect I take it that your view is on all fours with that expressed by Dr. Steinhart when he put together the report for the White House on this subject.

Now, those observations are by way of preface to my question, which is: Given the real world as it is, it is rather difficult, if we are to make substantial advance rapidly in this area, for us to multiply University of Wisconsin at Green Bays all over the country; therefore does it not make more sense that we get going along the lines of the recommendations of the report of Dr. Steinhart that you establish in existing universities some such interdisciplinary problem-oriented faculties of environmental studies?

Mr. Weidner. It makes a lot of sense. I suppose that educators, like politicians, have pragmatic elements in their being. Obviously, we must adjust our goals to the situations that we face. I would only say that I think it is a matter of priority; I would hope that this committee, through its consideration of this bill, would try to give priority in funding to encourage institutions to integrate this kind of thing in their general education pattern and for that matter in their pattern of discipline and professional educational.

But I don't think that should be the exclusive priority. I am very pleased to comment upon your question, because I would not want to be misunderstood in regard to that. When we get institutions of 30,000 and 40,000, and we have a number of them in this country, a number of them with that number of students, it is quite obvious that a special school or institute can attract thousands of students within that particular campus and it would be important to encourage this kind of thing, so long as this particular school or college within a larger university has an important general undergraduate mission rather than just training specialists.

I am not sure we need to emphasize the training of specialists. We are doing a pretty good job in that area, it would be my opinion. But, if I were to comment upon our sister institution in Madison, University of Wisconsin at Madison, it has recently established an institute on environmental studies at the undergraduate level, and . . . many . . . students . . . take courses in that institute as an option to add to their undergraduate education.

I think this kind of thing is desirable. But I think priorities, the prime carrot, ought to be across the board, university-wide.

The Lack of Environmental Education Materials

Mr. Brademas. Let me ask you just a couple of questions because my colleagues will want to ask questions. The bill under consideration today does not provide for the development of curriculum materials for teaching, chiefly at the elementary and secondary school levels and in community conferences, and I wonder, therefore, if you could comment on two aspects of your testimony:

One, how do you see the capacity of American higher education at this point in time to produce the kind of teaching materials for use in our elementary and secondary schools and in community conferences of a kind that are contemplated by the bill?

Mr. Weidner. . . . Let me say, first of all, as a philosophical basis, that many of the things I am saying assume that the university is doing the kinds of things that you have just outlined. We have a term that we have been using, and the term is "communiversity." I suppose the definition might be "a socially concerned university interacting on a reciprocal basis with a socially-conscious community outside of the university."

Truly, if one focuses on environmental problems in the manner that we have done, one can never tell when he is engaging in community outreach activities and when engaging in undergraduate instruction, when he is not helping secondary and elementary schools and when he is carrying out research, applied research, and undergraduate instruction. We meld the two together. I say this as a preface, as an explanation perhaps of some of the things I have been saying.

Relative to curricular materials for elementary and secondary schools, we would simply say that it is our feeling that these are very inadequate at the present time. We have started placing some of our young people in practice teaching situations. We had hoped they would be able to experiment somewhat with an environmental focus during their practice teaching. This has proved to be very difficult because of lack of materials and the tremendous amount of time, energy, and money that it takes to produce them systematically and to evaluate their usefulness. It is not always useful even though such materials look appealing to adults, because they sometimes don't have effect on the young people.

Similarly, in terms of community outreach activities, it is very difficult to carry out anything in a concentrated fashion because of lack of materials, once again. I think of some of our work in the foreign policy area, where we have had many, many years of experience of integrated materials that would lead adults into discussion groups for some weeks or even months and serve as an educational base, where we have [extensive] material for institutes and conferences, and I think this is not true in the environmental area.

Of course, anyone can hold a quicky conference or seminar at the present time, but we do lack systematic educational devices, and I am speaking of a noncredit variety, to work with the community, and we lack the materials to work into the elementary and secondary school level as well.

We have had some experiences working with school districts in our region, the Green Bay, Appleton, Manitowoc school systems—for example, Neenah-Menasha—and our school systems have been quite interested in working with us. Some of their school board members and superintendents or administrators are on advisory committees of UWGB. We have over 300 citizens on such advisory committees, incidentally. Some of these committees focus on elementary and secondary education.

It is the opinion of these advisory committees that we have a great paucity of information. The opinion of our overall community advisory committee is, we need materials for community outreach or adult education.

. . .

Is a Single-Purpose Curriculum Warranted?

Mr. Brademas. Thank you very much. Mr. Steiger.

Mr. Steiger. Thank you, Mr. Chairman. Dr. Weidner, your statement and philosophy, I think, is helpful to the committee. I must say that one of the things that concerns me, and for which I have no answer except by way of what kind of guidance you have given us, is the whole question of what we do each year when some new subject area of concern to the people in this country rises. One year it is engineers because of Sputnik and then it is physicists, and this year it may be colleges and the environment. All of that is well and it is good to focus on it, but I am not yet convinced that a single-purpose institute is really what needs to be done.

In your statement in Chicago, you made the point, and you made it again here today, about the UWGB philosophy requiring that the university be organized to devote itself to environmental problems rather than being imbued with sanctity of individual views and professions.

That being the case and in terms of the kind of community outreach concept that you have at the University of Wisconsin at Green Bay—that is to say that teaching, research, outreach all meld together—have you any kinds of specific suggestions that you could make now, or would you be willing to submit later, that the committee might use in trying to develop this kind of approach or give some seed money to institutions of higher education that might be willing to get into this kind of concept? Or should we do it?

Mr. Weidner. . . . It is very important to take a broad view of undergraduate education and its purpose. There is much in literature that suggests undergraduate education is primarily designed to stimulate people, stimulate students in their thinking processes. There is much in the literature about undergraduate education that suggests that developing skills in problem solving is an objective, and those are probably two ways of saying much the same thing. And I do feel, myself, that what the students today are demanding when they talk about relevance is primarily that they are interested in problem solving and application or examples of application; and particular examples that one uses during the life of an undergraduate are not probably so important as the fact that one uses examples and one does focus on problem solving; and if one focuses on problem solving, one also gets into disciplinary or interdisciplinary considerations.

All of a sudden a person who is majoring in chemistry understands if he is going to make a contribution after leaving, let alone when at the university, he has to learn to work with biologists and physicists and engineers and economists and political scientists and sociologists and teachers and lawyers and so on, and this is one of the great discoveries about problem solving, about cooperative action, and it is this kind of process we are interested in. It is this philosophy that undergirds our approach, and this is why we feel fundamentally that this is not a fad.

I know some people have said, "Well, look, now, there is a bill in Congress that would add environment to the concerns of education," and, you know, we had a variety of other things in the past—international education and other kinds of things that came along—and I would just say if we are going to take a problem-solving approach and if this is an objective of undergraduate education, the urgent problems that are right on every university's doorstep are environmental. . . .

Now, remember, our students become teachers and business administration specialists and chemists and political scientists just like other students, but what we seek to do is to focus their problem orientation on examples of environmental problems. . . .

Are Required Courses Warranted?

Mr. Steiger. Let me ask one more question. As I recall the state law in Wisconsin, there is a requirement that conservation, which I think is the word used, should be taught at least, or be included within the curriculum or taught for a specified period of time in high schools of Wisconsin. I wonder whether or not—although you may

not necessarily have taken a look at that question—whether or not that makes any sense to you, to try to require something such as we do in our state and, I think, in most states, such as physical education for a certain amount of time, history of the state for a certain amount of time, conservation for a certain amount of time, and can we either use that pattern and say this is a method to be used to get to the goal, or can you find a way to break that pattern if it is not effective?

Mr. Weidner. My own feeling is that it is probably unwise to try to legislate curricula. I don't think that the Wisconsin example would encourage this particularly. You recall that Wisconsin law [specifies] . . . an optional course, not a required course, but it is required that it be in the high school. . . .

It means also that if an institution of higher education is going to certify teachers, they have to offer such a course.

Mr. Steiger. Not just offered; isn't it required of elementary and secondary schoolteachers?

Mr. Weidner. Yes, but not required of elementary or secondary students or pupils; correct?

Mr. Steiger. Yes. So the teacher has to get it in his curriculum.

Mr. Weidner. That is correct. We have been working with the Department of Public Instruction in regard to this course to explore the possibilities of opening it up and broadening it a little bit. Traditionally, it has been a natural resources kind of conservation, and the department has been very interested in seeing what can be done in broadening it; but to get to the heart of your question, it seems to me that adding required components is not too effective, because what one gets is an isolated cluster there, an isolated cluster over there, and nothing seems to meld together, and it is the melding together with which I am principally concerned and which it seems to me this committee might well consider as its principal concern.

What we want to do is make a people excited about this, concerned about this, realizing that in their lives what they are interested in has something to do with environment, and I don't think we do this through a required course just kind of tacked on. One of the ways we have done it at the University of Wisconsin at Green Bay that could actually be copied in elementary and secondary schools, although I am not formally proposing it, is to abolish the freshman composition course and substitute in its place a general education course such as we have in the freshman seminar which gives the student about the equivalent in writing experience, but it is a writing experience on problems of environment, so that at the same time they are learning how to communicate more effectively in writing and in speech for that matter, they are learning about crisis, the ecological crisis, and how different fields of study are related to it.

We come back with a similar course in the senior year. By that time all of them have gone through specialized courses. At the senior level, we say, "All right, you majored in X, Y, and Z, and how is it related to problems of environment, particularly focusing on problems of cooperative action, cooperative problem solving. It is something that could be easily done in high schools. We are not adding anything to the curriculum. We are using an objective within the curriculum and focusing on environmental problems and perhaps making it more exciting, and enhancing motivation.

. . .

Mr. Brademas. Thank you very much indeed, Chancellor Weidner.

. . .

Introduction of Clay Schoenfeld, Journalist and Ecologist

Mr. Brademas. Our next witness this morning is also from the state of Wisconsin and would you like to introduce him, Mr. Steiger? Do you have a word to say about him?

Mr. Steiger. Yes . . . Dr. Schoenfeld is . . . from the . . . University of Wisconsin at Madison. I should say I was not one of those who had the privilege of being in journalism school at the university but I had the opportunity of both knowing and working with Dr. Schoenfeld when at that institution of higher education, and I am very, very pleased to have him here this morning.

His testimony is excellent, I think, and what he has done in terms of putting together the question of journalism and ecology is a very, very important aspect of what this bill is all about and, therefore, it is a delight to have you here, Doctor.

Dr. Schoenfeld. Thank you, sir. It is my privilege.

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[*Dr. Schoenfeld first made a few brief remarks emphasizing some points made in his prepared statement.*]

(Dr. Schoenfeld's statement follows:)

STATEMENT OF CLAY SCHOENFELD, JOINT PROFESSOR OF JOURNALISM AND WILDLIFE ECOLOGY, CHAIRMAN OF THE CENTER FOR ENVIRONMENTAL COMMUNICATIONS AND EDUCATION STUDIES, AND DIRECTOR OF SUMMER SESSIONS, UNIVERSITY OF WISCONSIN—MADISON

To do something about environmental conservation, redevelopment, and maintenance requires a sense of husbandry, a sense of responsibility on the part of every American citizen—that man-land ethic or "ecological conscience" which Aldo Leopold bespoke. It is unthinking people who pollute the environment; it is thinking people who can effect a "new conservation."

We are talking, then, about environmental education: "a recognition by man of his interdependence with his environment and all of life, and his responsibility for developing a culture which maintains that relationship through policies and practices necessary to secure the future of an environment fit for life and fit for living."

A Comparison of Environmental Education with Conservation Education

Many ask, what is the difference, if any, between the new "environmental education" and the older "conservation education"? The newer term attempts to do a more precise and at the same time a more comprehensive job of describing our ecological efforts to come to grips with the degradation of man's interlaced surroundings.

In terms of its scope, the new environmentalism attempts to be all-encompassing. Whereas yesterday we tended to treat soil conservation, water conservation, forest conservation, wildlife conservation, and so on as separate units, today we try to understand and explain the ecological unity of all man-land relationships. In terms of its focus, then, the new environmentalism is man-centered. That is, our primary concern has shifted from the

survival of remnant redwoods and raptors to the survival of nothing less than the human species itself. At the same time we are not so much concerned about quantities of natural resources as we are about the quality of the human experience.

In terms of its focus, while the old conservation conjured up images of open country, the new environmentalism incorporates the pressing problems of the city. In terms of its emotional underpinnings, the new environmentalism is based more on fear for man's tomorrow than on a love for nature's yesterday. Thus today's "preservationist" is not a lover of wilderness; he is one who fears the four horsemen of "conquest, slaughter, famine, and death." In terms of its political alliances, the old conservation was linked to such orthodox causes as depression pump-priming, national defense, and outdoor recreation; the new environmentalism, on the other hand, encompasses the hitherto unmentionable demands of the neo-Malthusians for population control.

It is in its basic cultural orientation, however, that the new environmentalism differs most strikingly from its antecedent, conservation. The latter, in the words of one patron saint, stood clearly for economic development, for the infinite goodness of American "progress." But environmentalism reflects a growing suspicion that bigger is not necessarily better, slower can be faster, and less can be more.

If anything surely marks this revolutionary nature of both the rise and rationale of the new environmentalism, it would be the recent words of a Republican President of the United States, telling us that "wealth and happiness are not the same thing," that now is the time to "make our peace with nature," and that we must "measure success or failure by new criteria."

Strategy for Environmental Education

Hence the search for a planning strategy for the new environmental education in America. If a national effort in environmental education is to be strengthened, we must (1) identify the audiences, (2) suggest methods, (3) outline an organization, and (4) propose a timetable. In terms of a timetable, I propose that we proceed simultaneously on a variety of fronts. In terms of an organization, I propose that we build "critical masses" of environmental education at the federal, state, and local levels. In terms of methods, I propose that we start with what we have and invest heavily in research that will reveal optimum tactics. In terms of audiences, I suggest three: elementary and secondary school pupils and their teachers, college and university students and their professors, and adults in their roles as leaders of community action and as citizens in general.

Particularly, we need to establish on appropriate university campuses Environmental Education Centers that will focus on the problem of translating resource management policies and plans into action on the landscape through (a) the collation of information about, and the preparation of practical materials on, restoring the quality of the environment, (b) informal instruction and technical assistance carried out directly to local governments, regional instrumentalities, and citizen groups, (c) the refresher education of key practitioners brought back to the campus for work in natural resource policy implementation, and (d) research in adult education theory and practice. Growing national programs of environmental management depend increasingly on state and local initiative and responsibility. "The problem of the states" as *Life* Magazine said in its editorial of Nov. 4, 1966, "is not lack of power or opportunity or even solely of money; it is a shortage of competent public servants." The proposed Environmental Education Centers would tackle the problem directly by up-grading such key community leaders as planners, lawyers, resource specialists, adult educators, communicators, teachers, and public administrators, and by reinforcing them with improved educational materials and professional consultation. The Centers would also be concerned with adult education and communications research.

Why do we continue to have serious trouble translating federal intentions and state plans into timely, sound action on the land? One answer would certainly seem to be it is only at the local and regional level that public policies can be translated into public and private practices, and it is here at the intra-state level where the forces of wise resource management continue to be ill-equipped to deal with the forces of exploitation. The inefficiency with which public agencies and private citizens go about performing the socially essential tasks of environmental housekeeping stem largely from the fact that the technical and organizational skills available to the land conserver or rational planner are normally inferior to those available to the land exploiter.

While we do not of course yet understand all the scientific facts and societal values attendant to environmental quality control, what we *do* know is not being applied on a scale commensurate with the present pace of environmental pollution. At the local and regional level, where most of the decisions affecting the quality of the environment are made, we must address ourselves firmly to laying a basis for action by elucidating the choices in land and water use, relating them to general values and social objectives, instilling in people a desire for constructive change, and providing practical guidelines that encompass integrated rather than unilateral approaches.

Local Leadership Training

The urgency of need will not be met through educational processes of normal pace and dispersion. What is needed now, and for some time to come, is a steady stream of specific skills and resources rifled to the local and regional firing line. We need local leaders equipped with an understanding of the interrelationships involved between their callings and total environmental management, and with a knowledge of the "tools of the trade" in energizing land and water use controls.

To begin to develop and equip a cadre of local resource management leaders it will be helpful to concentrate on those individuals at the local and regional level who typically do or can play the role of "change agents" in conservation. Four such categories of key personnel can be identified: (a) lawyers, (b) planners and administrators, (c) field resource technicians, and (d) communicators and educators.

To retrain all such change agents and to equip them and their clientele with effective education-for-action materials and services will be a role of the Environmental Education Centers. The Centers will also perform related research focused on improving their concepts and techniques. Initially an Environmental Education Center would assemble from the university and elsewhere as necessary a staff representing overall competence in environmental problems, to include people trained in biology, design, soils, economics, geology, engineering, ecology, sociology, public administration, journalism, education, law, and other environmental disciplines applicable to land-use issues. Their extension function would be the collection and collation of what is known, what has been done, what is being done, and what might be done; the preparation of educational materials, utilizing a variety of media; and the dissemination of information and technical counsel to local governments and citizen groups through institutes, audio and visual media, and consultation. The team would be encouraged to work with maximum speed and practicality, yet with intellectual breadth so that the environmental caretakers on the receiving end develop a sound view of the inter-relatedness of decisions affecting the environment and of the immense complexity of human needs that must be reconciled and met.

At the same time, the Center would provide fellowships for practicing change agents to come to the campus for a year of study focused on the practical problems faced by those trying to plan, acquire, maintain, and manage lands and waters for public purpose. These professionals would take regular courses and special interdisciplinary seminars, and will also perform research duties in the Center. Appropriate degrees could be awarded to qualified personnel.

A Comprehensive Program

In addition to such regional Environmental Education Centers, I envisage a National Environmental Education Program which will make organizational and fiscal provisions for the following main thrusts:

1. At the Presidential level, a National Commission on Environmental Education, charged principally with developing integrated concepts, methodologies, and materials.

2. At a Cabinet level, an integrated National Environmental

Education Center, lodged in the U.S. Office of Education but drawing support from all appropriate agencies.

3. At the State level, Environmental Education Coordinators in each Chief State School Officer headquarters.

4. At the local level, coordinators, curricula, committees, and sites to translate the national effort into action in the school and on the landscape.

It is essential that the Program be multidisciplinary in its posture and multi-process in its programs: unilateral approaches to environmental management have caused many of our present problems. What might be meant by multi-process? A program concerned with the production of new knowledge and new knowledge-seekers, of more and better resource managers, of citizenship education, and of technical counseling and services. What do we mean by multidisciplinary? We mean we are concerned with the total environment of man: its social, cultural, economic, and esthetic, as well as its physical and biological, aspects. To seek environmental quality requires both an understanding of human needs and the needs of a healthy natural environment. The development and management of environmental quality requires contributions by all the arts, sciences, and professions. The end is to bring conflicting forces into functional relationships in an order in which human impact does not needlessly destroy environmental quality and where environmental quality contributes to more fruitful human life, liberty, and the pursuit of happiness. While we recognize the essential importance of strengthening existing disciplines, the essential nature of environmental education looks toward research, teaching, and extension configurations that transcend traditional lines of endeavor and are concerned with the wholeness of the relationship between man and his surroundings.

The rationale for a National Environmental Education Program is simple: it is unthinking people who pollute the environment, and it is thinking people who can bring about environmental conservation, redevelopment, and maintenance. The spirit of the decade is a spirited search for environmental quality. To support and sustain this third American revolution will require an educational program as massive as the problem of human survival.

Focus of the Environmental Quality Education Bill

Mr. Brademas. Thank you very much, Dr. Schoenfeld. You have been a real pioneer in the field to which this bill is addressed and we are all the more pleased to have you with us today. . . .

[Do I understand correctly that you are] primarily concerned, and I do not say exclusively . . . , with the support of environmental education at the university level or at the adult education or two-year college level?

Dr. Schoenfeld. Yes, sir.

Mr. Brademas. You will appreciate, however, that the principal focus of the bill that we are holding hearings on at this point in time is to provide support for environmental education at the elementary and secondary school level and in community conferences and through the mass media and that the participation of colleges and universities in this bill is for the most part confined to the development of curricular materials, the development of model projects, the evaluation of the effectiveness of the use of such materials in such projects, and teacher-training, and that the bill as written, does not contemplate the provision of direct support to colleges and universities for them to offer to their students environmental education.

Are we clear on that?

Dr. Schoenfeld. Yes, sir.

Mr. Brademas. Are we clear on that distinction? Have I misstated your view?

Dr. Schoenfeld. Not at all, sir.

Mr. Brademas. But I take it that you are not quarreling with the need to do something at the elementary and secondary school levels, which is the principal focus of this legislation?

Dr. Schoenfeld. Not at all.

Mr. Brademas. It may well be that we need to take a look at the question of the involvement of colleges and universities in environmental education and the relationship between that enterprise and the federal government. It was my own perception, and I do not pretend to be an expert in this field and I invite your comment on this, that given limited federal funds, that it might be a more creative and useful effort for us to move in that direction insofar as federal monies are concerned, than to try to put funds into universities for support, for general support rather, if you will, in environmental education?

Do you have a comment? It is a matter of priorities at this time, it seems.

Dr. Schoenfeld. Assuming limited funds—and we have to do this; we have made that assumption—I would put my chips exactly where your bill puts them, if I interpret it correctly. That is mainly that you are going to emphasize the upgrading of teachers, the upgrading of instructional materials, and this will inevitably involve institutions where those teachers are trained and those materials can be produced. I am only saying this, knowing the tremendous ticket that would be attached to replicating University of Wisconsin-Green Bays. If money were no object, I might answer your question differently.

Responsibilities of Scientists to a Broader View

I would add . . . that the Congress ought to take a look at a lot of existing programs to see how federal monies now devoted to education might be refocused or redefined with environmental education as a goal.

Let me give you a quick example. If you look at the most commonly used secondary school general science text in this country, you will find that its opening chapter rightly talks about the scientific method, and it uses as its illlustration of how the scientific method discovers new facts that are then applied to the solution of public problems—it uses how we solved the malaria problem. The only trouble is it ends with DDT as the hero, and not one line about the ecological backlash. You might say this text is old, but it was rewritten, or republished in 1968, and I will also add this text was developed with NSF [National Science Foundation] money.

This is to illustrate there are lots of places that we need to take a look at where our federal monies are going and what they are doing.

Mr. Brademas. That example you have cited is a very telling one, it seems to me. I will be talking again with NSF before long with or without your permission.

In fact, I noticed the piece I was reading here published by G. E. Hutchinson in the January-February 1970 issue of *American Scientist*. [H]e is the Sterling Professor of Zoology at Yale, if you know his name, and is a member of the Environmental Studies Board and remarks upon some hearings that were conducted before the Senate Subcommittee on Inter-Governmental Relations in 1969 on

a resolution to establish a Select Subcommittee on Technology in the Human Environment. He says at one point in the hearings when Dr. Barry Commoner was testifying, Senator Muskie said, "Didn't we all along the way have the scientific and technological competence to identify the side effects, for example, of sewage treatment, fertilizer, insecticides, before we went ahead and put them into production? Where was the scientific community? Why didn't they alert us?"

I was struck by this in view of what you just said, Dr. Schoenfeld, because it seems that the scientists, or it would seem to me that the instance you have just given us and the rather telling plea of Senator Muskie there, represents the kind of narrow focus of attitude, that even our leading scientists have in this country and their unwillingness, perhaps, to adopt the multidisciplinary approach that you and Dr. Weidner and nearly every authority we have heard from on this matter have suggested.

So, I put this question to you in light of these remarks. How difficult is it, and I now confine myself to university level, to get all of these animals in the same cage, all of the faculty, the university professors and others, actually to adopt the multidisciplinary approach that you all seem to indicate is required if we are going to be making advances in this field, or are they so deeply rooted in their own narrow categories that they can't be shaken? I don't know if it is a fair question.

Dr. Schoenfeld. It is both hard or easy, depending, I guess, on the timing and your own state of mind. Dr. Weidner has had the remarkable opportunity to build an institution from scratch and the genius to send it off in the direction that he has chosen, and the good fortune, as he said, to have broadminded support.

At a large, strong, distinguished university like the mother campus at Madison, it is increasingly easy to get people talking together. There are two reasons for this.

First of all, as Dr. Weidner has said, the students won't let us live in little cloisters any more and, secondly, even though there is yet precious little money available for interdisciplinary research and teaching, we are picking up pebbles all over and putting together these kinds of programs.

So, increasingly, it will be possible at strong institutions to build these critical masses of environmental studies. I can't comment on how rapidly this will come about at the college level, although Dr. Hafner at Hampshire College is very optimistic that it will develop there, too.

Well, let me just say in closing, I certainly don't want to blanket all scientists as having failed to alert us. Actually, the voices of alarm have come from the Commoners and the Ehrlichs and the Allens as well as from the social scientists.

Mr. Brademas. I think that is a fair point and I don't want to be represented as having engaged in a sweeping indictment. It just occurred to me, as I listened to what you had to say on this multidisciplinary problem, that perhaps the most natural ecologist in this country is a politician, a congressman, because we have a lot of things swimming around all at once and how you cope with one problem may have an effect upon how you handle another one. It dovetails with your getting reelected and all kinds of matters essential to the survival of the Republic.

Mr. Steiger. You don't make statements like that very often to so many people.

Mr. Brademas. But the point I want to get at in observing that is that you cannot survive and be effective if you focus on a narrow category, it is just impossible.

What is the magazine *Environmental Education*, Dr. Schoenfeld, of which you are editor?

Dr. Schoenfeld. This is a brand new journal created as a vehicle for stimulating discovery and dissemination of new and better ways of doing just what your bill contemplates; namely, how better can we communicate these environmental attitudes that Dr. Weidner spoke of and how better can we educate young people, how better can we bring "how-to-do-it" materials to the firing line of adults?

Mr. Brademas. Do you publish it at your university?

Dr. Schoenfeld. No, this is an example of the private sector. Dembar Educational Research Services is a private corporation, headed, incidentally, Congressman Steiger, by a well-known Wisconsin Republican, Walter Frautschi, whom you know.

Mr. Steiger. Do you have copies or could you submit a copy for the subcommittee?

Dr. Schoenfeld. Certainly.

Mr. Brademas. That would be helpful. I have one other question.

Support for Establishment or Non-Establishment Institutions?

Some of the students involved in the Teach-in testifying before the subcommittee yesterday expressed concern about the fact that this bill would provide support to colleges, universities, elementary and secondary schools, and so on—existing institutions in the educational system—which they argued were not really well equipped to make adjustments necessary to provide effective environmental education.

They argued that the funds should rather be channeled through small, really nonpublic groups of concerned citizens who, they say, have been the ones who have dramatized the environmental crisis and who might be able to do a better job of educating. Do you have a comment on that?

Dr. Schoenfeld. It is possible they will turn out to be correct. I am an establishment man, myself, and I think education, or the education establishment, is a dramatic testimonial at any given moment to its responsiveness and responsibility. I would think that with the kind of energizing that this bill represents, you would see significant change on the part of the more flexible educational institutions at whatever level, and those that can't respond are going to fade away, and that is the nature of our society. But it might indeed be desirable for the committee to look at a separate title in the act that would sponsor I guess what you would call "wild-cat" ventures, because, who knows, these may be the forte of what will turn out to be the most innovative approaches.

The Availability of Knowledge for Environmental Improvement

Mr. Brademas. . . . [One] thing that struck me about what you and Dr. Weidner have said, if I interpreted you correctly, is that we have enough knowledge or at least we have an adequate body of knowledge and information in this field and what is essential is a change in attitudes in order to enable us to apply the knowledge that we have.

Is that a fair statement? Is that a fair interpretation?

Dr. Schoenfeld. I would like to qualify it just a little. I think I said that we know a lot more now than is being applied. I am equally sure there are vast areas of unknown knowledge that could very well help in the environmental rehabilitation program. With research being funded at the level it is today, I am confident these new insights will increasingly be uncovered.

The gap, it seems to me, is in translating what we now know into action on the landscape, and as Dr. Weidner says, this is primarily not a technical problem, it is really a part of the political process.

International Environmental Education

Mr. Brademas. I would ask one more question while you are here. No one has said anything yet about any potential international implications of the activities, of any activities we might generate in the field of environmental education. I note that George Kennan published an article in *Foreign Affairs* in which he proposes establishment of some kind of international environmental agency.

Do other countries have activities in environmental education either at the university level or at the elementary and secondary school levels or outside of the educational system in the field of environmental education from which we in the United States might learn?

Dr. Schoenfeld. Yes, sir. There is a growing international environmental education movement and I would suggest that the committee might very well call Martha Henderson, who is here in Washington on the staff of the Conservation Education Foundation, and the secretary of the U.N. Subcommittee on Conservation Education.

The headquarters of the subcommittee actually is in Switzerland. This committee is planning an international conference for 1972, but Miss Henderson could very well brief the committee on those countries that are, in terms of sophistication, at least, really ahead of us.

Mr. Brademas. . . . Dr. Schoenfeld, you have been most helpful to us and I hope that you will allow us later to call on you, as well as Dr. Weidner, for further advice as we get into the bill.

Thank you very much.

. . .

Introduction of Dr. Matthew J. Brennan, Director, Pinchot Institute for Conservation Studies

Mr. Brademas. Our final witness this morning is Dr. Matthew Brennan, director of the Pinchot Institute for Conservation Studies. Dr. Brennan, we know you, too, are a pioneer in this field and we look forward to hearing from you. Please go right ahead.

Dr. Brennan. Thank you very much.

I would like to take advantage of being the last witness to comment briefly, before I start my testimony, on a couple of questions that came up.

I just returned from Venezuela where I spent the last two weeks. The minister of education there is in the process of developing a three-year project for a national environmental educational program from pre-school to the university. I am pleased to be serving as director of this project. This will have implications, I think, for the work of this committee.

I have a couple of other things I wanted to comment on but I think in view of the time I will just move on, because I do want to speak specifically to the act itself. I want to make some recommendations and suggestions and some comments. My congratulations to you, Mr. Chairman, and to Congressmen Scheuer and Reid and Hansen for your leadership in introducing this bill. Congressman Steiger, it is nice to see you here. I want to answer a question you asked Dr. Schoenfeld a minute ago.

The reason there are few title III projects in outdoor education in Wisconsin, Congressman, is that good programs like Manitowoc and Wausau and Poynete and Eagle River weren't qualified under the Elementary and Secondary Education Act, which limited funding to new and innovative projects. So they lost out.

This failure to provide support for ongoing projects is one of the weaknesses of the act.

The Need for Environmental Education

If man is the only living thing which can consciously manipulate, control, destroy, or preserve his environment, then a knowledge of his actions and their environmental consequences should be an essential element of his education and of his understanding. It is not, and the reason it is not, I believe, is a failure in American education at all levels.

I believe that much of this failure can be traced directly to a general lack of public commitment to the quality of the environment, which is reflected in the historical lack of attention to education for the environment in the U.S. Office of Education and in the state education agencies.

Therefore, it is with great pleasure that I, who have spent most of my professional life trying to develop a structure for environmental education, note that the U.S. Commissioner of Education is being given responsibility for the establishment of the environmental education program under this act.

This is long overdue. It is a move which has been recommended for years by the Conservation Education Association (about which you asked a question a moment ago, Mr. Chairman, and I will comment later if I might), the Natural Resources Council of America (made up of 34 national and regional conservation and environmental organizations), and during the past few years, by the Citizens Advisory Committee on Environmental Quality, under the chairmanship of Lawrence Rockefeller.

In response to these recommendations, a coordinator for environmental education was appointed in the U.S. Office of Education. However, in view of the fact that there are presently, or there have been, 110 projects in environ-

mental education financed under title III of the Elementary and Secondary Education Act of 1965, it is apparent that the U.S. Office of Education is woefully understaffed to make any significant contribution to the development of evaluation of these projects.

So, there is no need for us to spend time discussing the need for this legislation. There is little public understanding of the environment and man's role in the maintenance of its quality, and little public support of activities designed to enhance environmental quality. People are making demands on the environment without understanding the effects on the quality of the environment. . . .

Section 3, Uses of Funds

Perhaps it would be helpful to the committee if I commented on each of the program elements under section 3 of the proposed act:

(1) Making grants for:

(*a*) Projects for the development of new and improved curriculums. This is the essential first step. However, we should keep in mind two important things—

1. Curriculum development is a lengthy process of writing, testing, revisions, retesting, and editing. I worked for seven years on the South Carolina Conservation Curriculum Improvement Project, which resulted in those guides. We cannot expect any significant results from projects whose financing is limited to three years or less.

2. Many excellent curiculum materials have been produced by the environmental education projects under title III of the Elementary and Secondary Education Act. They should be collected, evaluated, edited, and disseminated to the schools of America, especially those initiating new curriculum projects under this act. We must learn from our successes and our failures of the past.

(*b*) Pilot projects to demonstrate and test the effectiveness of the curriculums developed:

I am pleased to note that these demonstration pilot projects could include projects already funded under title III of the Elementary and Secondary Education Act. In fact, I could recommend that 10 or 12 outstanding title III projects be continued for just this purpose. This could provide some of the regional centers so necessary for full implementation of any national environmental education program.

(*c*) Projects for dissemination of materials and information:

One of the great deficiencies of the title III environmental education projects was a lack of any plan for collection, evaluation, and dissemination, of the curriculum materials produced under clause (a) before demonstration pilot projects are set up, under clause (b). This evaluation and dissemination could be accomplished by the U.S. Office of Education staff or by contract, as indicated [in section 3 (a)(1)(c)].

(2) Evaluation. This job of evaluation, in my opinion, should be undertaken before dissemination, as outlined in clause (c).

(3) Teacher training. This is good. However, until curriculum materials are developed, collected, and ready for dissemination, any programs of teacher training will have limited value. One of our biggest problems in environmental education historically has been the emphasis on teacher training for nonexistent school programs, with no curriculum materials for their use.

(4) Adult education. Good. We must move on all fronts at once. I am a little upset about the clause, especially for adults in the bill, however. [That is in 3(a)(4).] I think we have a great potential in the youth organizations and I think we should not overlook this.

(5) Mass media materials. Good. I understand that a program such as this is already underway by Public Broadcasting Corporation.

Section 4, Approval of Applications

Here, I am using my experience as a former specialist in the U.S. Office of Education and as consultant to many of these new title III projects. I am pleased to see the role of the state educational agencies spelled out. I might even go so far as to deny approval of the commissioner if the state educational agency has serious questions as to the worth of a grant proposal under this act. I have worked with the supervisors of science, curriculum, and environmental education in nearly every state, and there is no more competent or dedicated group in this nation. Their assistance to the commissioner in his allocation of projects can make an important contribution to the success of the programs under this act.

Section 5, Advisory Committee on Environmental Quality Education

Your recommendation, Mr. Chairman, and other members of the committee for an advisory committee on environmental quality education is excellent and should be implemented.

Section 6, Technical Assistance

Good. I would recommend U.S. Office of Education staff members to work with all of these agencies and organizations. All of these programs should also be under the direction of the commissioner of education. Only in this way will the competition which exists among the resource agencies be eliminated.

Further Comments and Recommendations

A. U.S. Office of Education.

1. Since environmental education involves every program in the U.S. Office of Education—elementary, secondary, higher, adult, vocational, research, and so forth—the coordinator must be of associate commissioner rank in order to direct the total program of environmental education at the national level.

2. Specialists in environmental education must be added to the U.S. Office of Education Washington and regional office staffs as the first order of business. We must learn from our experience with NDEA and ESEA, title III.

I was fortunate to be on the staff when we set up the NDEA—National Defense Education Act—program in 1959 and 1960. The U.S. Office of Education was staffed with specialists in math, science, and foreign languages.

These specialists provided consultant services, gave

workshops, and generally coordinated a national program. Working directly with state educational agency specialists, also provided under NDEA, they produced spectacular results in improving instruction and curriculum in the designated subject areas.

Under title III, ESEA, no specialists were provided, either in the U.S. Office of Education or at the state level. Yet, 110 environmental education projects were funded. They received no U.S. Office of Education assistance in planning, conducting, or evaluating their projects, and no assistance in dissemination of the materials and information they produced.

We must staff the U.S. Office of Education and the 50 state education agencies. The cost [would be] $1.5 million per year, which I estimate will be a sound investment, just as it was in NDEA.

B. State educational agencies should be included under section 3, . . . In fact, the state education agencies are being equipped to implement the programs included in this act.

C. Funding. Provision should be made in the bill for local participation in funding, with complete local financing after three of four years. For example, during the first year, 80 percent federal, 20 percent local; second year, 60 percent, 40 percent; third year, 40 percent, 60 percent; fourth year, 20 percent, 80 percent; fifth year, completely funded locally.

If this is planned, it will be accepted by the local community and implemented. If it is not planned, programs will end when federal funding ends, as happened with so many fine title III programs.

Since Congressman Hansen is here, I will specifically point out the American Falls, Idaho, project, one of the finest environmental education programs under title III, which has ended. The director and two other members of the staff are now directing title III projects in other states. This is a tremendous loss to Idaho, and it should not have happened.

D. I would recommend that the development of understanding of the problem of balancing the population with the available resources of the earth should be given priority in any environmental education program to be funded under this act. We are just kidding ourselves if we continue to concentrate on the visible effects of overpopulation —pollution, pesticides, poverty of the environment, the "P" problems, I call them.

It is people who demand resources. Industries only provide them. It is people who produce wastes of all kinds. It is people who demand more and more electricity and power—with the resultant problems of powerplant pollution. At the same time, it is people who demand more outdoor recreation, more open space.

If we allow the population in the United States to double by the year 2000, as experts predict it will, we can spend every dollar in the federal budget every year and still do no better than keep even with the "P" problems. It is the job of environmental education to help the American people to understand this.

E. I would give immediate consideration to reopening the shuttered Job Corps centers across the nation as regional centers for environmental education. I believe these centers could be operated on a fulltime basis at little or no cost to the government.

Incidentally, since I wrote this, the superintendent of public instruction in Washington, Louis Bruno, just received a multiple use permit from the Forest Service to operate the Cispus Job Corps Center outside of Vancouver, Washington, as a state center for environmental education. This can be done at no expense to the government.

The New Jersey State School of Conservation has been self-supporting for most of its 20-year history, with courses and workshops for up to 10,000 teachers and students a year. Next year its budget will be $299,000. The school must return $250,000 to the state, which means a $50,000 cost to the state.

For this, 10,000 teachers and students will participate in five-day programs of environmental education. The Southern New Jersey Center for Environmental Education, set up under a title III grant, will become self-supporting next year when federal funding ends.

Incidentally, they did this 80-20, 60-40 funding formula I recommended earlier, and it was planned in the beginning that the local community would eventually take over the funding. So, we are not guessing. It has been done. It can be done.

F. We should not overlook some of the long-established centers where environmental education has been carried on. May I refer again to some of the programs in Wisconsin, for example, about which Congressman Steiger asked.

Many of these could be expanded with some assistance under this act. One of the tragedies of many so-called innovative environmental education programs financed under title III was the federal funding of new programs while long-established programs struggled along on a limited budget.

For example, just two miles down the road from the New Jersey State School of Conservation, the largest title III program in environmental education in the United States was set up with a budget of $250,000 a year. The future of this program is in grave danger when federal funding ends this year. This kind of situation could have been avoided by professional staffing at the U.S. Office of Education and state level, and provision for approval of projects by the state education agency.

G. We should consider the establishment of an advanced center for environmental education, preferably a cooperative institute bringing together the combined resources of university, business, and community to serve the nation's need for a quality environment. Such a center could provide:

1. Conferences on policy and practice in environmental education.
2. Seminars and institute study for leading educators and teachers.
3. Courses and seminars for curriculum planners.
4. Curriculum studies in all subject areas at all levels of education.
5. Preparation of publications to disseminate the deliberations of conferences, findings of seminars and studies,

and improved instructional material as developed.

6. Assistance in the development of outdoor laboratories as integral units of school facilities across the nation.

Suggested Budget

I have also made preliminary estimates of what the program might cost.

Mr. Steiger. You attached this, or am I missing page 13?

Dr. Brennan. I left that out because I was not satisfied with it, sir. I would be happy to prepare a recommended budget, if the committee wishes.

Mr. Brademas. I think it would be helpful, indeed. I do happen to have your page 13 here. Are you suggesting that you would not like to have it in the record?

Dr. Brennan. Well, the Democrats tell me I am modest and the Republicans tell me I spent too much.

Mr. Steiger. So, you better stick with what you have then.

Dr. Brennan. Well, the other thing is I wanted to read all of the hearings and get a little better indication of the direction in which this act is going before I can make specific recommendations.

Mr. Steiger. I ask unanimous consent that, at whatever point Dr. Brennan is prepared, we submit that.

Mr. Brademas. Without objection that would be agreed to and, indeed, I am sure all of us would be most grateful to have your judgment on this, because you will note that we don't have any specific dollar authorization in this bill and the reason, I think—and Mr. Hansen will agree, I think—is we want to hear from those of you who are going over the figures, . . . and then we would make judgments on what we thought was feasible and realistic.

(The document requested follows:)

Operations	
U.S. Office of Education Deputy Commissioner	$ 35,000
15 EE Specialists, 10 regional, 5 in District of Columbia	300,000
15 Secretaries at $6,000	90,000
50 State Department of Education EE specialists at $15,000	750,000
50 Secretaries at $5,000	250,000
Subtotal	1,425,000
Program	
A. 10 Regional centers at $350,000	3,500,000
(a) *Should—May* be existing centers with capacity to perform in first year.	
(b) To serve as models for curriculum development, teacher training research.	
B. 10 New centers at $200,000 for innovative program development	2,000,000
C. Contract for evaluation, collection, and publication of new materials	500,000
D. Research in EE, Scope, Sequence, Teaching methods—new media	2,000,000
E. Training:	
(1) Teacher, in-service—model centers 5 at $200,000	1,000,000
(2) Teachers, preservice, 5 model centers	1,000,000
(3) Community leaders, 20 at $50,000	1,000,000
Subtotal	11 000,000
E. 4 Government leaders: Service projects (1) to establish cooperative programs	200,000
(2) advisory centers—using resources of land management agencies	
F. Community projects, 20 at $50,000	1,000,000
Adult education, pre-school-youth, community leaders.	
G. Media, PBC	3,000,000
Subtotal	4,200,000
Total	16,625,000

. . .

Mr. Brademas. I may say to you we have another person who is engaged in a similar enterprise for us, so we can match up your recommendations with his and see what you come up with.

Dr. Brennan. Mine will probably be modest because I believe what we are talking about accomplishing under the act can be done for very little money.

Mr. Brademas. This is encouraging, if I may say; at least it is encouraging to me.

The Need for a Review of Environmental Education Materials

I want to thank you very much for this statement; it is an extremely valuable statement, Dr. Brennan, because you zeroed in on some of the specifics. In respect of the title III ESEA projects in environmental education, are you saying that if we were to pick up the phone and call the Office of Education and say, "Whoever handles these, please come over and tell us what you have been doing," that there would be nobody at the other end of the line?

Dr. Brennan. There was one coordinator of environmental education appointed last year on the basis of recommendations by the groups I mentioned. I don't have to say any more than that she had 110 projects on environmental education to oversee and she operated without a travel budget.

Mr. Brademas. That is bad.

Dr. Brennan. That is enough said.

Mr. Brademas. I think it would be helpful if we had whatever information is on hand over there on the kinds of curricular materials utilized in the projects as you suggested in your testimony and I take it you are suggesting we ought to pull all of this material together so we can see what already exists?

Dr. Brennan. Yes. I have four file cabinets full of curricular materials produced by title III Elementary and Secondary Education Act projects and they never have been collected, evaluated, edited, or disseminated. It just is a total loss as far as the curriculums in the nation are concerned.

The Need for a New Act

Mr. Brademas. Let me make this general observation and see if you agree.

It, in part, follows a colloquy. Mr. Steiger and Dr. Weidner said that it may well be possible under existing legislative authority that environmental education projects could be undertaken, some of the kind contemplated under this bill.

On the other hand, not much has been done, and I think one of the reasons for, or one of the arguments for a separate bill of this kind is to dramatize to the country the importance of moving in this field. It is similar to our drug abuse education bill.

We were told by the administration in July, "Well, you don't need it really because we carry out drug abuse education in the schools without additional authority." We said, "Very well, what are you doing?" They said, "Nothing." And I think that this is one instrument we in Congress have to try to dramatize the importance of action in a field like this. Would you quarrel with that analysis?

Dr. Brennan. I would not at all. In fact, I would say, "Amen, amen, amen." We must have the act, first of all, because of the prestige it gives to the idea.

Second, we must have some kind of coordination. If we just try to do it under existing programs, then it will get lost in the corridors of the U.S. Office of Education, which as you know has a lot of corridors, and there must be a plan spelled out which directs this office and this office and this office, and so on.

In other words, what does research contribute and what do elementary and secondary bureaus contribute and what do the Children's Bureau, Vocational Education and Higher Education contribute? Somebody has to coordinate it at the top or it will never be done.

Mr. Brademas. I take it a corollary of what you said is if there is not some direction, as you say, then nothing is likely to happen, because the tendency is to keep on doing whatever it is you are doing now and why bother to change. Is that a fair statement?

Dr. Brennan. Exactly.

Composition of the Advisory Committee

Mr. Brademas. You referred to this advisory committee and said you think it is a good idea. We have been told by the ecologists or by an ecologist that we ought to be sure to require that the ecologist be a member of that body and the students yesterday said we ought to be sure the students are represented. I don't denigrate either of these suggestions.

Have you any comments on who must be members of such a committee for it to be effective?

Dr. Brennan. Well, I think I would start with ecologists and kids and go from there. There are a lot of us old fellows that have been pushing around this thing for a long time unsuccessfully. We need ecologists. Of course, I don't think we should try to separate them. I am an ecologist, too, but there are ecologists who are also educators and there are some who are not. I have been working with kindergarten kids developing concepts we used to consider [in] fourth and fifth grade science. It can be done quite well with those kids and we don't know, at what age children develop concepts in environment. . . .

The Need for Environmental Education Materials

Mr. Brademas. You made the point it was a mistake to rush into teacher training, which nearly everybody has agreed upon the importance of, without having good curricular materials?

Dr. Brennan. I am almost alone on this, so don't be alarmed, but I have, as a former professor, trained teachers in environment education and they will write to me and say, "Well, my administrator won't let me do this. I can't take the class outdoors, I can't take a bus for a field trip, and there is no program."

Now, I could give you an even more drastic statement. When the American Broadcasting System program came on, on something about survival, I told my daughter Patti, who is 17, she ought to hear this. She said, "Daddy, I know it is important to you, but I have a test on the geography of China tomorrow and I have to do it and this is part of my program and your environment stuff is not part of my program."

We can't train teachers for a program that does not exist. It can't be done that way. We did it or tried to do it with space science after Sputnik in NDEA; I am not all pro-NDEA and anti-title III, ESEA, because we did bad things in NDEA, too, and one was rushing space lessons without materials. We are doing it now with the environment. You must give a teacher materials before you can train her how to use them.

Environmental Education in Other Countries

Mr. Brademas. Finally, I will put to you the same question as put to Dr. Schoenfeld: are there other countries of the world that have carried on environmental education in so successful a way we might learn from what they have done?

Dr. Brennan. There are some who have done things that we could learn from. For instance, Switzerland has made extensive use of their railroads to bring children to the environment. We had a title III project submitted in Idaho last year—I am not saying it because you are here, Congressman Hansen, but the Idaho State Department of Education science supervisor and social science supervisor are totally committed to environment education—and one of the projects they presented was for the use of the idle Pullman cars of America to bring kids around and show them the environment, so they are not just singing about "rocks and rivers, rills and templed hills" and so forth, but going to see them.

As they approached a new region, they would have teacher workshops to teach the children, or go on a field trip or whatever they wanted to do. I told you about the Venezuelan project I am going to direct under UNESCO. We are also going to develop a Latin American center for environmental education at the Simon Bolivar University in Caracas which we hope will be financed by the Ford Foundation.

There are a lot of things going on we can learn from, but if you get the act passed, we will still be ahead. I urge it at the earliest time.

Mr. Brademas. Mr. Steiger?

Who Should Develop Materials?

Mr. Steiger. Dr. Brennan, I must say your testimony is about the best I have heard in a long time.

Dr. Brennan. Thank you very much.

Mr. Steiger. One last question . . . [W]ould you concur with Dr. Schoenfeld that elementary and secondary

education and adult education are the two highest priorities before we get into the question of university education?

Dr. Brennan. I don't have any question about that. We must start with elementary and secondary education. In fact, I would go earlier than that. i think our experience now is showing that some of the inside feelings that I was talking about a minute ago are developed at an earlier age before they even get to school.

But, for the purposes of formal education, it should definitely be elementary and secondary. This relates to a question of the chairman earlier—the universities are not equipped to do this business of curriculum development. The university people, most of them don't have any idea of what is going on on their own campuses and don't know a thing about what is going on in elementary and secondary schools.

That is the last place I would go for help for curriculum development.

Mr. Brademas. Where would you urge it be done?

Dr. Brennan. It must be done locally, written by teachers and used by teachers and revised and edited and what have you. Curriculum development is a job for the teacher.

Mr. Brademas. With whom would they work?

Dr. Brennan. Consultants, with the kinds of people I talk about putting into the Office of Education and state departments of education. They are also present in other organizations such as the Conservation Education Association, made up of 800 dedicated professionals operating on a budget of $5,000 a year. With a little help, those 800 people could be put to work as consultants for these kinds of programs. We have the resources but just don't use them.

Mr. Steiger. You agree, don't you, Doctor, that there are in fact opportunities for funds under an existing federal program or programs, but would I be fair in characterizing your assessments of the effort both by state departments and the U.S. Office of Education as simply having been a lack of focus toward what goes on within each of the various categorical types of programs we have?

Dr. Brennan. Yes, it goes right back to my daughter's statement. It is not part of the American curriculum; therefore, it is not a concern of education and it is sort of falling between the chairs and nobody has picked it up. It is not part of our program.

You people are going to make it a part of our program and unless you do, we are just going to spin our wheels and we are not going to do a thing.

Mr. Steiger. You have been very helpful and I appreciate your help.

Mr. Brademas. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman. I would echo my colleague's comments just to tell you how extremely helpful the testimony has been. It is such a pleasure to tap your very considerable experience in similar programs so that we can take advantage of your constructive recommendations in shaping this program.

I think probably my colleagues would also appreciate your comment of a moment ago on the need to look at the preschool years as the place to begin. As you may be aware, this subcommittee has been devoting much of the last several months to the development of legislation designed to provide programs at a preschool level. I think all that we have learned about the importance of early intervention is applicable to environmental education.

The Need for Collection and Dissemination of Materials

I have only one question, which touches on your reference to the accumulation of knowledge, experience and materials, as a result of the program that had been carried on in the past.

Do you see the need in this legislation for some kind of mechanism, perhaps in the U.S. Office of Education, to draw upon the experience of all of the programs that will be stimulated by this legislation or otherwise and to make information available in some understandable and easily usable form to all who could make use of it?

Dr. Brennan. Yes, I think this is essential, absolutely essential. Otherwise, we have lost this great resource we have. As I said, I have four file cabinets filled with excellent curriculum materials that should be in the schools of America today and are not.

Mr. Hansen. Would the U.S. Office of Education be the proper place?

Dr. Brennan. It could have been done in the U.S. Office but it didn't have to be. If there was provision in title III of the Elementary and Secondary Education Act for the publication and dissemination of materials, it could have been done.

The Newark, New Jersey, schools, for example, did set aside some money and published the materials, but it is not entirely legal.

Mr. Steiger. Will you yield. Is there any kind of ERIC [Educational Resources Information Center] operation?

Dr. Brennan. Some of the ERIC materials, some of environmental education materials have been collected by ERIC at Ohio State University.

Mr. Steiger. Which is the Ohio State ERIC, what field?

Dr. Brennan. It is primarily science education. That is another of our hang-ups, of course. We have based a good deal of our environmental education in the past on science, and although we have the scientific knowledge to solve almost every environmental problem we have, the decisions are not being made on the basis of our scientific knowledge at all.

The Broad Scope of Environmental Education

It is economic feasibility, political expediencies, our population problem will get into religion deeply, so you see it is social sciences. And if the people from the Wilderness Society were here, they would tell you that if the things which ennoble man are those which ennoble man's use of the environment, then it is the humanities that we are concerned with.

We are actually talking about all of education, every bit from the time you are born until the time you die, all of the disciplines, all levels, a total program of education. People try to categorize this. They say environmental education is just another fad. It is not any fad.

This is total education. That is, for the environment, for survival of man—total education. It is no category, but a

total program of education we are talking about that we must develop.

Mr. Steiger. If the gentleman will yield further, the Educational Media and Materials Center for Handicapped Children—one could, I suppose, argue that same concept out to be applied in this field?

Dr. Brennan. Certainly.

Mr. Hansen. Well, let me thank you again and tell you that I shouldn't be surprised if we have you come back many more times.

Dr. Brennan. I am delighted to be here. This is one of the great happenings of my life and I am so pleased to see you doing this. Pass this bill quickly.

Mr. Brademas. Thank you very much. You have been most helpful.

We are adjourned for this morning subject to call.

(The hearing adjourned at 12:10 p.m. subject to call of the Chair.)

DAY 4

House of Representatives, Select Subcommittee on Education
Washington, D.C.

Tuesday, April 7, 1970

On the fourth day, the subcommittee heard testimony on the contributions which the behavioral sciences, architecture, and engineering can make to understanding environmental problems.

James L. Aldrich made a strong case for the inclusion of behavioral science insights in environmental education programs. He pointed out the unfortunate tendency to think of environmental education as a new approach to teaching the natural sciences. The root of the problem, however, is in our "cultural attitudes toward life and nature." Social, physical, esthetic, and psychological considerations must be integrated. Federally funded curriculum materials of the past decade, while excellent in other respects, lack this comprehensiveness.

Aldrich also suggested that the environmental education movement might be the vehicle for accomplishing a virtual revolution in American education, a view to which Congressman Brademas took exception because it would overload "this frail barge," as he called the bill.

Two architects and an architecture student urged explicit recognition of urban and other man-made environments as a focus of environmental education. They expressed regret that architects have not been as concerned as they should be about the impact of their designs on the environment and suggested that schools of architecture should take greater pains to foster a broader view of the architect's role.

Engineering, both as cause and as cure of environmental problems, was the central theme of William Sowers' testimony. He attributed environmental problems to man's ever-increasing ability to create adverse effects which exceed his ability to "perceive, judge, prevent or control them." If the education of engineers more fully stimulated social consciousness and holistic views, then engineering might fulfill its vast potential as a source of solutions to our environment problems.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas, presiding.

Present: Representatives Brademas, Scheuer, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. Brademas. Today we meet to resume consideration of the bill H.R. 14753, The Environmental Quality Education Act. . . .

Introduction of James L. Aldrich, Education Adviser, International Union for Conservation of Nature and Natural Resources

Mr. Aldrich. Mr. Chairman and members of the committee, I want to express my appreciation for the opportunity to present my opinions at these hearings. With your permission, I would like to present a slightly paraphrased version of my prepared statement.

In preparing my statement, I have sought to make a contribution to these deliberations which would stress points that I felt were important but which might not otherwise be emphasized. Thus, I have not spoken in detail of the high priorities which I assign to teacher training preschool through grade eight, or science materials on the biophysical environment. Instead I have addressed the need to teach the behavioral sciences in the elementary and secondary schools as part of environmental education.

Mr. Brademas. I wonder if, before you proceed, you would be kind enough to identify yourself.

Mr. Aldrich. I am the acting vice president of the Educational Development Center, which is a regional educational laboratory in New England, and the education advisor to the president of the International Union for the Conservation of Nature and Natural Resources.

As I was saying, there is a real opportunity in environmental education, one which I believe could promote a significant reform of education in general. It involves not only the subject matter but the organization of the educational experience.

By definition, it goes beyond the brick and mortar school into the natural and man-made community. It also provides opportunities for the individual to explore within himself the perceptions and interpretations through which he relates to the world.

The Role of the Behavioral Sciences in Environmental Education

To a large degree, environmental education is assumed to be a new approach to the teaching of the natural sciences and that all that is needed are some classroom materials on the crises of the biosphere. In fact, the need is for a concentrated effort to develop the materials, teacher training, and style of classroom operation which provide the basis for exploring the vast web of relationships of man with nature, of man with men, of the partnerships which must exist if we are to re-establish a life worth living.

The curriculum material available to the student needs to relate to the world in which he lives. The science, mathematics, and social studies instruction must have some bearing on the polluted river that flows near the school, the overcrowded highways, and the oil slick that has closed the local beach. But we must avoid dealing with the symptoms rather than the disease. The biophysical environment is in trouble but the roots of that trouble are to be found in our cultural attitudes toward life and nature.

Our environment is despoiled largely because our culture and the education which reflects it have failed to develop the necessary understandings of important relationships of man in the biosphere. Man is part of nature and man in conflict with nature is man in conflict with himself. The major thrust in environmental education must be towards developing the individual's ability to understand himself as a subject, both individually and in community. Inherent in this understanding must be the self-confidence that he can and does affect his environment.

A working definition of the "environmental education" that I am thinking about might be that education which provides the individual with the materials and opportunities to appreciate his relationship to his total environment or world.

In this sense, it can be conceived of as a collection of interrelated experiences which allow the individual to explore the social, physical, esthetic, and psychological worlds that he inherits. Through these experiences there should be the opportunity to strengthen or develop the student's confidence that these aspects of the environment, his environment, can be changed—and most importantly, that he can effect change.

Innovative Materials for Environmental Education

The last decade has seen the funding and development of a rich array of curriculum materials in a wide variety of subject matter. Curriculum reform has been a significant accomplishment, but educational reform has been minimal. For the most part, the materials that have been produced do not deal effectively with the issues that I am trying to cite here. They do provide a rich resource to draw upon. Perhaps even more accurately, the scholars who participated in these programs are a truly valuable resource with which we can take a giant step forward in education.

Two programs that I am familiar with suggest some of the exciting possibilities to be found in environmental education. The fifth-grade program, *Man: A Course of Study*, which has been developed by the Education Development Center, is based on the question, "What is human about human beings, how did they get that way, and how can we make them more so?" Through a series of interrelated materials the student is encouraged to develop a permanent relation to these questions about the essence of human behavior.

The other program, which is more modest in size, but fully as stimulating an educational experience, is being developed by Mrs. Barbara Ellis Long in St. Louis. She has been experimenting with a program in the behavioral sciences within the school setting for upper elementary school children. The emphasis has been on what she calls projective education; [she uses] experiments and games, with free-wheeling discussions by the children of the principles involved and the insights gained. The goal is to develop coping strengths by furthering the students' understanding of the human animal and his peculiarities.

The point in mentioning these two programs is not to minimize the need for better materials on the physical environment but simply to indicate that they are environmental education, too—at least by the definition which I have proposed. Unfortunately, the programs of this type are few and far between. Clearly these are directions and

ideas which I believe the Environmental Quality Education Act should support.

A Broad View of Environmental Education

Conservation and the rational use of our natural resources are vitally important matters. The environmental distortions which confront us must be corrected if the quality of our existence is to improve rather than continue to disintegrate.

The education of individuals who are knowledgeable concerning the biophysical environment and its existing problems, aware of how to help solve these problems, and motivated to work toward their solution, is an important objective.

But in order to achieve that objective we must appreciate that the environment is both external and internal to individuals.

The mutual relations between an organism and its environment are, in the case of man, subject to individual perception and interpretation. Environmental education must embrace these points, or fall short of meeting both the needs of the environmental and the educational crises.

Therefore, I believe that through education we must not only develop a better understanding of our physical environment, but we must foster a deeper understanding of ourselves. Only in this way can we begin to reorientate our priorities in terms of the man/environment relationships and change the behavior of individuals. What I am hoping for is that this act will support environmental education by promoting needed fundamental educational reform.

Given the considerable stresses on society, and the rapid rate of change, we cannot afford the luxury of a formal education which reflects a past; nor even one that deals with today's topical issues. These are not new ideas in education. Perhaps they are more acceptable now because what was seen as desirable education in the past has now achieved the urgency of necessary education.

I am concerned that it is only knowledge of the biosphere which is labeled as necessary while greater understanding of man, the organism, is only seen as desirable.

I believe that the act which we are considering here, or which the Congress is considering, can support this sort of education.

Thank you, Mr. Chairman.

. . .

Mr. Brademas. Thank you very much, Mr. Aldrich, for a most interesting statement.

International Efforts in Environmental Education

I wonder if you could tell us a little more about the workings of the International Union for the Conservation of Nature and Natural Resources, and make any observations you would care to make concerning any international implementations of the effort in the field of environment education.

Mr. Aldrich. The Union is an organization that has been in existence for over 20 years, formed out of the concerns of a number of people about environment, about conservation, back in 1948. It is based in Switzerland and has a large international membership. It is divided into commissions which reflect the various specific professional concerns, such as legal, education, landscape, wildlife, and various other specific topics of conservation.

It seeks, through various conferences and publications, to bring to the attention of governments and international bodies these particular concerns with a professional understanding, with a professional training.

. . . I feel that the environmental education [is] . . . important on an international scale, [or national] since . . . boundaries don't restrain pollution the way that people might think they should. There are a number of movements, both within the Union and outside the Union, in terms of the type of evidence I have been speaking of.

Mr. Brademas. Could you indicate whether there are any other countries in the world that are embarked on programs of environmental education analogous to the kind of things we are talking about in this bill?

Mr. Aldrich. To the best of my knowledge the scope that is being proposed in this bill is not covered. There are many programs in outdoor education and biology in various parts of Europe. They are concerned about the developing programs for this type of education, but there is nothing that I am aware of that is as comprehensive.

Mr. Brademas. I am impressed by your definition of environmental education. . . . You, in effect, define it as a "concentrated effort to develop the materials, teacher training, and still have classroom operations which provide the basis for exploring the vast web of relationships of man with nature, of man with men, of the partnerships which must exist if we are to re-establish a life worth living." You then touch on a subject that I would be glad for you to expand on a little, and I refer to what I take you to be saying, namely, that you are hoping that this environmental education effort could be viewed as an overall effort to reform our educational system generally.

The Need for Broad Educational Reform

Do I misread you at that point? The reason I raise the question is simply that your position is not unlike the statement made by one of our witnesses last week, who in effect said that we have to change the whole system of American education if we are to be able to make any kind of impact so far as environmental education is concerned.

I can appreciate the force of that argument, but am somewhat repelled by it in that it seems to me to be loading this frail barge with more than it can reasonably be expected to carry. Am I making my point clear?

Mr. Aldrich. Yes, it is quite clear and it is a point which I have been bothered with. There is a tendency, which I have myself, to look at this sort of thing and begin to define it in such broad terms that it becomes hard to manage. However, I sincerely believe that unless we can bring this sort of broad attack to bear upon the educational problems, we really will not get at the problems of environmental education.

I believe it is a fundamental education reform that is needed and that it will require the talents of people who have worked in curriculum reform in the past and have a liaison with groups that are just coming to this really

significant area. I really feel that we would fall short, very far short, of the object of your legislation if we did not proceed in this way.

I merely want to go further and cite that we have had a fair amount of curriculum reform which is, for the most part I think, brilliant work which has brought into the field of education scholars who would not normally be involved in concerns of elementary and secondary schools. But the curriculum reform has essentially, in my belief—and these are personal beliefs, I should stress—very rarely prepared us to do the job of education. Let me rephrase that.

We are essentially teaching the same subjects with better materials. I believe that we cannot do it that way. Education does need reform and I think this education legislation must contribute to it.

Mr. Brademas. I can sympathize with what you are saying. There has been referred to this subcommittee a bill that I introduced and which is the administration bill, to establish a National Institute of Education. Among the subjects that I would hope we get into would be the whole area of educational reform to which you have been referring.

The only concern I have, however, is that if one logically follows through your points, . . . I would push it a step further and say, then, you have to make fundamental changes in American society. I don't think you disagree with that proposition.

Mr. Aldrich. No; not at all.

Mr. Brademas. If you come to that point in time, I would have to say—well, I agree, but as a legislator I am only in that line of work partially. We here have to be incrementalists. We can't reshape American society through this environmental education bill. I suggest if we were going to adopt your point of view, we would stop the hearings today.

Mr. Aldrich. I hope that would not be the case.

Mr. Brademas. I am suggesting we move ahead in a piecemeal fashion, as it were.

Mr. Aldrich. Your point is quite clear and I would hasten to say that the Environmental Quality Education Act should not be expected to include the whole thing all at once. I would hope that it can provide the opportunities for programs to develop which will give us insights of this sort, that it will be defined in terms of the relationship to major educational reform.

The Status of Development of Materials for Environmental Education

Mr. Brademas. I think we are on all fours. You spoke of curriculum development. We are familiar with some of the splendid work that American physicists have done in helping the teaching of physics in the high school level in this county. What is going on, if anything, in the way of cooperation between university people in the whole spectrum of environmental studies and elementary and secondary school people in developing curriculums for environmental study for use in the schools as distinguished from use in the university?

Mr. Aldrich. There is considerable activity in the area of natural science. . . . There are a number of people in this country who are working in this way. I am not sure of any major curriculum efforts of the scale that have been supported by the National Science Foundation and other agencies in the past.

Mr. Brademas. Nor am I, and that is one of the reasons that I hope your testimony . . . in which you say, "We must not permit the growing demand for new curriculums which 'stress' the current wave of environmental concerns to delay needed fundamental research and improvement in education" would not mean to indicate that we really are making substantial headway in the area of developing environmental studies curriculums for just elementary and secondary schools in this country.

Mr. Aldrich. No, far from it. The statement was really meant to direct hope that this legislation would contribute to a continuing reform.

Mr. Brademas. So, we are in agreement that we need to do more work in curriculum development. Who ought to be doing it? I think the bill, as is drafted, is suggesting that a good deal of it be done by colleges and universities. Do you have any comment, coming from EDC, on that point?

Mr. Aldrich. Obviously I would hope for the university scholar's involvement; I would hope for the involvement of organizations such as EDC. I think there must be ways found to support local development in school systems. I think this sort of thing is possible. It might be that the university scholar should relate directly to the school system rather than the schoolteachers going through what are esssentially university programs.

Mr. Brademas. I have a couple of other questions, but I will yield to Mr. Hansen and if he doesn't ask them, I will.

Environmental Education and Educational Reform

Mr. Hansen. Thank you, Mr. Chairman.

We appreciate your helpful testimony here this morning. My questions relate to the same line that the chairman . . . pursued. I noted in your testimony you say, "The biophysical environment is in trouble, but the roots of that trouble are to be found in our cultural attitudes toward life and nature."

This seems to reinforce other testimony that we have had in these hearings—and I can't disagree that this is the root of our trouble; nor can I disagree with the main thrust of your testimony that emphasizes the need for some basic reforms in our entire educational system.

My question is whether you believe that this bill, with its fairly limited and specific objectives, can carry us in that direction, however small and modest a step it might be, the bill being limited to the kind of specific programs that involve curriculum development, pilot programs, evaluation, teacher training, programs in the community to emphasize the threat to the environment, the causes of the pollution, and some of the remedies.

Is this bill properly framed to help achieve the objectives that you have identified, and with which I agree, in your testimony?

Mr. Aldrich. Yes; I would certainly feel that it can contribute to the concerns that I have for educational reform.

I would hope that the definition of environment could be broadened to allow for some work in these other areas.

The reaction I have myself is that it reads "the physical environment"—and I really do not believe that curriculum on that topic alone is enough. A rather loose definition of ecology is the relationship of an organism with its environment. I believe we have to understand the organism as well as the environment. We must go into the area of the behavioral sciences and the social studies, more than into the natural sciences alone.

Where to Teach Environmental Education

Mr. Hansen. Some of the witnesses who have testified in these hearings have suggested, as the chairman has noted, that maybe we shouldn't confine our efforts too much to the educational institutions. What comments do you have with respect to the value of reaching out into the community, in the noneducational institutions and organizations to carry this effort forward?

Mr. Aldrich. This is an area which I cannot really speak too effectively on. I have qualms that not many people can. I think the greatest possible involvement of the community should certainly be explored.

Mr. Hansen. Within the educational community, where should the emphasis be placed, looking at the elementary, secondary, university, preschool?

Mr. Aldrich. My own very strong feeling is that it should be at the elementary through junior high level. . . . The teacher training aspect, both preservice and inservice, is going to be perhaps the hardest to tackle in many respects, because we are asking for many people to work in a way which they themselves are not familiar with and we are asking them to teach in a way that encourages behavior which they themselves do not follow.

Mr. Hansen. If another piece of legislation before this subcommittee is approved and implemented—one in which the chairman and myself are deeply interested; that is, a bill that would expand and improve and strengthen programs of preschool services to children—do you think there is a proper place in those programs for the kind of environmental education you referred to in your statement?

Mr. Aldrich. Without question I think that is one of the best places to begin. Everything supports this; that many of the attitudes which I am seeking to redress, as they affect our natural environment, are formed at that stage. I put my stress on the very early stages; yes.

Mr. Hansen. Thank you very much.

. . .

Mr. Brademas. I think I have exhausted the questions I was going to put to you. We are very grateful for having you come. Thank you.

Mr. Aldrich. Thank you.

Introduction of Rex Whitaker Allen, James Pratt, and Taylor Culver, Architects

Mr. Brademas. Our next witness is Mr. Rex Allen, president of the American Institute of Architects, who I hope will introduce those who are accompanying him.

We are glad to have you with us, Mr. Allen.

Mr. Allen. Thank you, Mr. Chairman.

My name is Rex Whitaker Allen. I am a practicing architect from San Francisco, California, and president of the American Institute of Architects (AIA), a professional society representing over 24,000 licensed architects. Accompanying me today are: James Pratt, a practicing architect from Dallas, Texas, and chairman of AIA's Joint Committee on Public Education; and Taylor Culver, a Howard University architectural student and the immediate past president of the Association of Student Chapters of the American Institute of Architects.

The American Institute of Architects strongly supports H.R. 14753, a bill whose general purpose is to promote greater understanding of environmental considerations by developing special educational assistance programs. We commend the sponsors of this legislation for their foresight. . . .

Home, Neighborhood, and City as Part of the Environment

Environmental quality is not only conservation of natural resources, or the preservation of our streams, lakes, and forests. It is also quality in one's own home, in one's own neighborhood, and in one's city. Our man-made environment requires attention parallel with nature. Visual pollution, urban physical deterioration affecting social processes, and misuse of land are all examples of the destruction of the built environment.

Education for this kind of total awareness requires a multidisciplinary approach. There is need to make clear that curricula include the concept of quality of effects and the subject of buildings, neighborhood, streets, highways, drainage, historic and cultural factors, and all other man-made elements in the environment. Environmental education is not only art, social studies, and science, but also mathematics, history, and every other academic discipline. We cannot allow traditional compartmentalized thinking to blunt the effectiveness of this program.

The enactment of such an education program would instill in the citizen an ability to foresee the long-range consequences of man-made projects before they occur. Planning and design with these consequences in mind could then serve as the primary means to insuring environmental protection rather than penalizing violators after the fact.

Accordingly, we suggest that in the committee report on the bill the word "environment" be defined to include not only natural resources, but also the built environment, including important historic and cultural aspects of our national heritage, both of which must be considered as relating to each other and forming the whole.

Educational Activities of the American Institute of Architects

Many private organizations have undertaken a variety of programs to stimulate public concern. For instance, the AIA sponsored a $100,000 "Study of Education for Environmental Design." What emerged from the study was a process for planning and evaluating new programs that

are needed if we are to educate individuals who can work together to build a more human environment. . . .

In line with the results of this study, we recommend that section 3(a)(3), defining those eligible for training for environmental controls, include professionals, especially those with the responsibility for the creation of physical products.

There are other examples of what the private sector has done in the field of environmental education recently:

The AIA provided a $10,000 grant to our Philadelphia chapter to develop texts and teaching aids to promote environmental awareness at the junior high school level. These aids were tested in the Philadelphia school system and are now in use in other school districts in the United States.

We have engaged in a $200,000 nationwide advertising campaign to pinpoint environmental ills and what can be done about them. Perhaps you have seen one of our advertisements in *Time, Fortune, Harpers,* or the *Saturday Review.* Incidentally, this program has generated over $2 million in public service TV time.

We call our efforts to your attention as an example of what many concerned groups have been doing. Our efforts will continue, but they are not enough. Federal support of environmental education programs is important if the good intentions of both public and private groups are to have a significant impact on the public's awareness.

To take full advantage of private initiative, we suggest that section 3(a)(5) be broadened to authorize the Commissioner to make grants to, or enter into contracts with, institutions of higher education and other public or private agencies, institutions, or organizations for the preparation and distribution of materials suitable for use by the mass media in dealing with the environment and ecology.

We appreciate the opportunity to present our views. If there are any questions, we shall do our best to answer them.

Mr. Brademas. Thank you very much, Mr. Allen. . . .

Environmental Responsibility of the Architectural Profession

Let me ask this rather fundamental question. To what extent is the American Institute of Architects prepared, by their education and training, to be concerned about the impact of what they design on the environment and seek to persuade their clients of the importance of attending to that problem, as distinguished from serving the needs of the community without paying much attention to broader environmental issues?

Mr. Allen. I would say that by training the profession is well prepared. On the other hand, perhaps we have not been, as a profession, sufficiently concerned in the past to exert the kind of influence that we should. We have become a great deal more conscious of this in the last few years and I believe that, as a profession that is trained to be concerned about visual matters, we are in a position to be of great assistance in pointing out the environmental problems which we have possibly helped to create in the past.

I think there is much greater sensitivity now to the overall effect of the design of man-made environment and what it does to the community and there is a growing sense of responsibility on the part of the profession of architecture to make known to the client the real problems of it, particularly in urban areas. I think there is a much greater responsiveness to the users' needs rather than simply the clients' needs. . . .

Mr. Brademas. . . . [There is an] extraordinary proliferation of ugly buildings in this country. Somebody did it. If you can't count on the architects to educate the layman, where are we to turn?

Perhaps I shouldn't mention it—but I remember very well putting a question to one of your predecessors several years ago when we were considering the 1965 Elementary and Secondary Education Act, asking him what AIA had been doing in the way of thinking through the implications of this significant new federal program to provide educational opportunities for children in disadvantaged areas from an arcihtectural point of view.

The response I got was absolutely horrendous, in my opinion. "We are technicians." I said I was brought up to believe that people like Thomas Jefferson and Leonardo Da Vinci really told what architecture was all about. I take it what you are saying is that there has been a change of attitude and a little "soul" is coming into architecture.

Mr. Allen. I would sincerely hope so. Obviously, people don't change overnight, but the emphasis has definitely changed. The AIA particularly has been very responsive to this within the last five years. Our whole orientation is much more toward developing a sense of public responsibility.

We are thinking of the letters PR—which we used to call "public relations"—as now standing for "public responsibility."

Mr. Pratt. I think my generation would be with you on Thomas Jefferson and Leonardo Da Vinci. I find, in my relationships with professional schools teaching architecture, planning, and urban design, that they are indeed very socially conscious to the point that we almost do not consider visual values in the school training at this point.

The great influences are all from the behavioral sciences and what students are thinking about today, particularly the anthropologists' viewpoints on how space affects personal psychology and the art of living.

Our profession as a whole, plus the planning profession, plus the urban designers that lie between us, are all beginning to worry much more about the overall relationships in the environment than they have in the past.

We can see this from some of the efforts of our profession that Mr. Allen mentioned, particularly educational efforts that have been undertaken in Philadelphia called—I have a copy of it here—*Our Man-Made Environment, Book 7* for the seventh and eighth grades' basic use. You will find in this that there are questions such as what are the components of a neighborhood; what do we need to have near our dwelling in terms of public services and public facilities; and how do these factors influence our living patterns, our choices, what age [groups live where] —factors that have never really been considered in edu-

cational terms before.

Environmental Responsibility of Young Architects

Mr. Brademas. Mr. Culver.

Mr. Culver. When you ask the question about are we prepared through our education to deal with these problems, I don't think in the past that the educational system was set up to concern the architects with the issues that are with us today.

I think what is coming about today is an in-house change within the AIA and many institutions concerned with it as an issue. We are better educated to deal with it than others.

I don't think we are the best educated. There is a long way to go, as I look at it. I like the remark about the profession five years ago and I think you can tell that there have been great changes even by looking at the make-up of this panel.

I am sure I wasn't here first. I am sure it didn't have the color that this organization has at this point. I think the students in the AIA and in all organizations in the world have moved to a point of environmental concern that hasn't been shown before.

This is a healthy new attitude that, as far as students are concerned, puts us in a position of pushing those who are responsible for making changes.

Mr. Brademas. To what extent, gentlemen, are architects . . . participating in the Teach-in across the country?

Mr. Culver. I can't say for architectural students as a group. I can only say for myself. I am going to be a participant because I am a part of a firm of new young guys, and this is primarily why we got together. We want to shed the old traditional way of practicing architecture and become more concerned with environmental conditions. I will be a participant.

Mr. Allen. I think there is a significant participation by the profession as well, by the chapters of the AIA. It isn't as much as I would like to see. We have sent out literature to all of our members to encourage participation and it, of course, is a local matter. . . .

Mr. Pratt. I will add to that that, in my city, young professionals are very interested and committed to the Teach-in program and have been pushing the older members of the profession in this regard. They are speaking to secondary schools on that today and I can name at least ten of them in my city.

. . .

Mr. Brademas. I would like to observe, from my own point of view, that architects have a unique role in helping educate people in the communities of which they are a part to be concerned about their environment. You are professionally educated in that area and I should like to express my own hope, in any event, that we will see an expansion of the initiative that your testimony here clearly represents so that we can look to architects across the country to provide significant and substantial leadership in the whole environmental field.

Further Educational Activities of Architects

Mr. Allen. My own chapter in northern California, in San Francisco, has been working now for a couple of years on an outline of input into the social studies curriculum that is being tested in schools in Marin County, which has elicited a very great interest on the part of the state system as well. After the testing period, hopefully it will be introduced into the state guidelines.

This is a program that goes all the way from kindergarten to eighth grade. It is quite an extensive effort. It has involved 12 committee members over the period of the past two years. We have had some funding from the national organization now to the chapter to bring in consultants to help to polish the program and make it more suitable.

The emphasis is very definitely on developing environmental awareness, and visual awareness, not on esthetics, per se, and certainly not to encourage people to become architects, but rather to improve the decision-making climate of future generations. It is a long-range program.

Mr. Brademas. Yes, Mr. Pratt.

Mr. Pratt. I would like to add that the national AIA has a committee on this subject and we have just surveyed the various components of our operation. From what we can identify in other areas in education for environmental matters, we find that there are some 35 components of our organization which are presently undertaking projects in this area. Some of them are not extensive and are very modest, but some of them are quite ambitious in their relationships to primary and secondary education particularly.

Additionally, we find there are some 25 efforts, nationally, of other interested groups producing materials for primary and secondary education, particularly. Only some four of those are, at present, commercially available and are, to us, meaningful in terms of what we see as important values for environmental education.

So, there is a definite need for further funding for the enlargement of this process if we are going to significantly influence public attitudes on the subject.

[*There followed a discussion of whether government support to improve school designs is desirable. Mr. Allen expressed doubt about the feasibility of "legislating" good design.*]

Statement of William Sowers, President-Elect, Consulting Engineers Council

Mr. Brademas. Thank you very much, gentlemen. . . . Mr. Sowers, would you like to go ahead?

[*Mr. Sowers made some comments on his prepared statement, after which Mr. Brademas directed that the statement be included in the record.*]

WILLIAM A. SOWERS' STATEMENT IN BEHALF OF CONSULTING ENGINEERS COUNCIL/USA

Mr. Chairman and Members of the Subcommittee, the Consulting Engineers Council of the U.S. is pleased to note the interest of the Congress in developing a greater public awareness and understanding of the need for protecting this nation's environment. We appear here today to share with you some of our concerns and to join with the American Institute of Architects in support of the concept of a Federal program to enhance environmental education at all levels.

My name is William A. Sowers. I am a partner in the consulting engineering firm of Sowers, Rodes and Whitescarver in Roanoke, Virginia. . . .

The Work of the Engineer

My presence at this hearing, however, is in connection with my capacity as President-elect of the Consulting Engineers Council of the United States, a not-for-profit organization of approximately 2,300 private practice engineering firms. Consulting engineers are in the forefront of environmental design. For example, typical projects handled by our members include: The Lake Tahoe Water Purification Plant, Sitka Dam in Alaska, the Hempstead, New York, 600-ton incineration plant, the Dallas-Ft. Worth Regional Airport and Shea Stadium.

For the most part, however, the average consulting engineer is concerned with slightly smaller, less noteworthy projects involving street lighting, sewer systems, air conditioning of buildings, recreational development, site planning and similar public works. It is in this capacity as consultants to communities, industries and government—that our members have long been aware of America's mounting environmental pollution problems. Consulting engineers were, in fact, among the first to warn of the dangers of thermal pollution from atomic power plants, and for centuries engineers have pointed out the importance of adequate water treatment, as compared to proliferation of outhouses or septic systems.

What has truly brought the environmental engineering issue into focus today is the fact that man's ability to create adverse effects has reached the point where it occasionally exceeds his ability to perceive, judge, prevent or control them. As a result of an apparent insatiable desire for convenience and comfort, man is finding that he is producing situations in both his natural and man-made environments which he can neither tolerate nor control, and which are often irreversible.

Examples of what can happen, such as the eye-smarting Los Angeles smog, or the impending death of Lake Erie, are all too familiar to us. These events, and many more, dictate that the U.S. immediately undertake a concerted program to promote environmental quality and, at the same time, plan for and protect various personal and political values for the 100 million additional citizens which are projected for this nation in the next thirty years.

Certainly much can be done through massive local, state and national public works-type programs and we are certain to see some improvements by virtue of stricter government controls as well as by means of the threat of legal punishment. In the engineers' opinion, however, successful efforts to conserve our natural resources and more effectively manage the environment will depend in large measure upon the ability of the people to understand, and to cope with, the related complex technical and social problems, as well as to develop and implement programs for the distribution of information on a broad scale. In short, America (in fact, the world) needs to maintain and expand its current "environmental consciousness" through broad educational programs in the schools, and more generally, through an adult education program for the public as a whole. We believe that H.R. 14753, and related bills, represent a first step toward this goal.

Engineering as an Environmentally Relevant Career

We feel obligated, however, to point out that our support of this measure involves selfish as well as altruistic objectives. A recent poll of our Consulting Engineers Council member firms revealed that the major problem confronting our profession is a critical shortage of trained and qualified technical personnel. What is particularly alarming is the fact that this shortage shows every indication of becoming more pronounced in the years ahead due to the steadily declining enrollment of prospective engineers in the various universities and colleges. While figures for the present year are not yet available, the percentage of all freshmen enrolling in an engineer curriculum dropped from 23.3% in 1957 to less than 10% in 1969. The actual number of junior and senior engineering students dropped from 106,141 in 1968 to just over 96,000 this year.

Other than the long-standing complaint that engineering is an extremely tough subject, the major cause of this reduction has been the deglamorization of engineering and the growing attraction of science to young men and women with engineering inclinations. The allure of the Apollo moon program, for example, is considerably greater than the "prestige" of designing a sewer treatment plant.

We believe that an increased educational emphasis upon imaginative new programs in environmental science will almost certainly spark an enthusiastic response from students at all levels. It only stands to reason that increased exposure to such issues, plus public recognition of the importance of finding solutions to environmental problems of an applied nature, will most certainly result in the attraction of more and better students, *and faculty*, to this type of work. That can only result in more people looking to careers in environmental engineering.

Consulting engineers have already been stirred to action by the need to attract more students to our profession. Several of our chapters sponsor summer intern programs to acquaint high school students with the important services being rendered by engineers. In New York State, members of our Council invite Cub Scout groups and elementary school classes to visit their firms to learn what we do, and why we do it. These students go to actual job sites and see first-hand the importance of proper drainage to prevent soil erosion, or the value of designing a pumping station to look like a private home in order to maintain a residential continuity in the neighborhood.

Resources Directory on Environmental Expertise

In Colorado, Oregon, Illinois, and Iowa, consulting engineers are available as guest lecturers at local high schools and colleges, and in Minnesota, consulting engineers have produced a series of half-hour television shows to explain the environmental problems with which they deal.

While programs such as these barely scratch the surface of what our profession could, or should, be doing in the way of helping define public need and opinion, they are sufficient to prompt us to suggest that a tabulation of talent and information resources would constitute a valuable addition to the provisions of H.R. 14753. Such a compendium could be compiled under the direction of the Commissioner of Education as an addition to Section 3 of the bill, or by the Advisory Committee on Environmental Quality Education, as described in Section 5 of the bill.

The advantages and benefits of a resource directory of existing programs and activities, and of qualified environmental experts, is self evident. At little or nothing in the way of Federal expense, the Commissioner of Education would have at his disposal a roster of organizations and/or persons whose talents and experience could be utilized in connection with projects approved under the Environmental Quality Education Act. Consulting engineers (and I am sure that architects, conservationists, botanists, and others) would be pleased to make themselves available at no charge, other than expenses, for "teach-ins", guest lectures, seminars or similar environmental education program-related activities.

Composition of the Advisory Committee

In this connection, Section 5(b) of the Bill, describing the constituency of the 21-member Advisory Committee, appears to us to emphasize selection and appointment of educators, editors and sociologists as committee members. We would like to suggest that this Section be reworded to encourage appointment of individuals experienced and knowledgeable with the various fields of ecological and environmental science, including persons familiar with education, information media, conservation, architecture, engineering, science; agriculture and similar fields. In some respects the present criteria, while broad, could mean the automatic elimination of certain key professions from participation in this important public body. As an example, in discussing the consulting engineers' interest in environmental education with a members of this Subcommittee's staff, it was necessary to explain what relation the consultant had to the subject of environment.

The Advisory Committee is, incidentally, required to advise the Secretary of Health, Education and Welfare, while actual

administration of programs under this bill is made the responsibility of the Commissioner of Education. It would seem appropriate to have a direct relationship between the Advisory Committee and the Commissioner, rather than with the Secretary.

Suggestions on the Budget of the Act

While we realize that authorization of a specific dollar amount has purposely been omitted from the initial draft of H.R. 14753, it is assumed that comments along these lines would be welcome. We note that other bills on this subject—specifically S. 3237—suggest a beginning authorization of $10 million for an environmental education program. Our Council believes that a more practical approach, in the light of delays experienced on several other vital programs authorized by Congress in recent years, would be to approve a relatively smaller first-year authorization of between $2 or $3 million which would adequately finance the organization and "tooling up" for the program. Included in this amount should be both funds and authority for the environmental education information resource analysis mentioned earlier in this testimony.

In limiting the first-year appropriation to not more than $3 million, Congress should, of course, commit itself to a subsequent year authorization of $10 to $12 million for conduct of the various programs set forth in the Environmental Quality Education Act. Perhaps this could be added to the bill. . . .

Adult Education Programs

The real challenge lies in enhancing the general education of the adult public. Several avenues of approach must be developed and implemented, including exhibits, demonstration projects, encouragement of popular magazine articles (written by experts and not by uninformed alarmists), quality television shows and movies, adult education programs by institutions and private groups, and encouragement of more and better public discussion groups and forums.

The League of Women Voters, Parent-Teacher Associations and conservation groups have already made substantial strides in this area. Our own Consulting Engineers Council is inaugurating several programs related to adult education ranging from the establishment of engineers' speakers bureaus in at least half the states, to sponsorship of public-interest forums on specific subjects.

An outstanding example of the latter was an all-day meeting held February 24 in Seattle, Washington, in which consulting engineers from that state sought to clear the air regarding design, location and projected impact of Interstate 90 on the City of Seattle. More than 300 people turned out to hear experts on both sides discuss tunnels versus cut overs, multiple use versus air rights, aesthetics and acoustics, and projected community development, both with and without the new highway. Architects, educators, editors, attorneys, planners, wildlife experts, and city officials joined with engineers in bringing the I-90 project into focus.

The Responsibility of Engineers for Environmental Quality

Most consulting engineers willingly accept the premise that our profession has an inescapable responsibility for providing leadership for our swift changing technological world. Engineers have taken justifiable pride in their creations which, despite consumption of many of our resources, have eliminated the dust bowls and flash floods of the 20's and 30's, cooled our homes and offices in the hot summer, and brought the comforts of electricity and running water to rural America.

Often a consulting engineers' complaint that an airport extension might drive away wildlife, or that dumping of waste in a river could make the water unusable to those living downstream, fell on the deaf ears of government agency personnel whose primary concern was with first cost. One San Mateo, California, engineer who objected to the location of an interstate highway in an urban area, rather than in a more scenic and remote section (the latter at more cost), was faced with the ultimatum of either getting on with it, or getting out. In choosing the latter alternative, he became the exception rather than the rule, for there is little return on standing up for one's convictions in the face of government pressure.

Today, awareness of the environmental situation is slowly changing. Environment, conservation and ecological protection are "in"; expediency at all costs is out. Tomorrow, historians, educators, doctors, bakers, and even Indian chiefs will, as a result of this legislation, bring preservation of our environment to front stage center. We feel it is attention which is long overdue and we are pleased to lend our support to this important measure.

We thank you for the opportunity to appear here today.

Mr. Brademas. Let me say I think it is a first-class statement. . . .

Lack of Emphasis on Broad Environmental Issues in Engineering Education

May I put to you, Mr. Sowers, the same kind of question that I put to Mr. Allen and his architectural colleagues.

To what extent does engineering education in the United States today provide training and education and concern about the whole spectrum of environmental issues?

Mr. Sowers. To my personal knowledge this effort in our universities is very limited. As a matter of fact, we, in our council, know of many colleges and universities where even one engineering department does not have a proper relation with another engineering department.

They don't speak to each other. They are jealous of their own little niche. This also is true between the school of architecture and other schools in universities having to do with and learning about our environment.

Mr. Brademas. [In] what you have so gently observed there may be the explanation for a lot of the evils inflicted on the American eye. If the engineers can't even talk to the engineers, then we laymen are really left with the short end of the stick.

Mr. Sowers. I think, as Mr. Allen pointed out and as I mentioned just a little earlier, this is being corrected among the architects and engineers in this country. . . .

I think we are gaining it very rapidly. I might relate to you a visit I had with the Nevada Association of Consulting Engineers just two weeks ago. I spoke to them about this very subject. They admitted that they have not had the proper relationship with the American Institute of Architects in that state and they are taking immediate steps to do this.

The other reason I mention this visit is that I asked these engineers what they thought was the number one priority for the Consulting Engineers Council in the immediate years to come and they said environment, ecology, pollution, whatever you want to call it; there is nothing else left.

Mr. Brademas. I may be simply repeating some of the questions we have been discussing here, but it does seem to me that engineers who wish to regard themselves as a profession don't want to find themselves in the trap of being simply regarded as technicians—not that there is anything ignominious about being a technician, because that is another question I want to ask you about—but the idea of a profession has always seemed to me to be one which suggests that there is some sort of broad or philosophic context within which a man views what it is he is about. I am much encouraged about what you have

said, about what the engineers are doing within their own profession to stimulate interest in the environment and, second, about what you say about the cooperation with the architects and those in other professions.

I would hope that if we were to meet five years from now, that a genuine revolution would have taken place, both in architectural and engineering education in the United States with respect to the issue we are discussing here today.

I have just two other quick questions.

I understand that there is some difficulty in the United States in attracting young people into the engineering profession. Is that any longer the case?

Mr. Sowers. That is quite true and we think that it is because of the glamour that is often associated with space agency projects. I can speak for my own firm. Some of the finest young engineers that we get are not those that are graduates straight out of college. We have a very difficult time getting them. Perhaps we can't compete, pricewise, with industry and some of the space programs in paying the salaries that are offered these young men. Even if we could, we still would have a problem getting them. Some of our best people are people who have been in industry and in the space agency for two or three years and have then decided that this was not their niche in life. They would like to come back into the consulting field.

Mr. Brademas. That last phrase you used is the one I was getting at. One reason people don't go into engineering as a career is that they view engineering today as without much excitement, without much relationship to ideas, to what the really great issues facing our country are.

Mr. Sowers. As we understand the bill, we feel that this will help to enhance our profession, and entice young men into it.

Mr. Brademas. Thank you very much.

. . .

[The Chair recognizes] the gentleman from New York, the distinguished member of this subcommittee and sponsor of this legislation. You may be interested to know he has been the principal champion in Congress in insisting that any bills we authorize to the construction of facilities should be accompanied by one-percent set aside to be used for insuring attention to making the buildings esthetically attractive.

I fear that the legislation authorizing the construction of the Rayburn Building was passed before he came to Congress.

Need for Understanding the Cost-Benefit Concept

Mr. Scheuer. I thoroughly enjoyed the testimony. It will give us a great deal to think about. I had experience before coming to Congress as a developer of large-scale housing projects and often when the architect wanted good architecture and planning, the engineers would argue successfully that it had to be done another way because it was cheaper.

In the past the engineers' comparative lack of interest in and concern for esthetics has hurt the architects—and I don't wish to exculpate the architecture fraternity for they have not had as much concern as they should have had. Yet, I wonder whether it wouldn't be a good idea for engineers to have some training and experience in providing alternative courses of action for a particular engineering problem which would measure the environmental fallout of constructing sewers or roads or powerlines in one way rather than another.

Frequently they will say, if you do it differently it will cost *x* dollars more. They are not really thinking of esthetics as a valuable factor in making the decision. They don't consider the environment trade-off as a plus. Do you think we can inculcate any rigorous discipline in cost-benefit evaluation of environmental factors in the engineering as well as the architectural schools?

Mr. Allen. I certainly hope we would and I don't think that esthetics is something that the architect has sole right over. I think that anyone doing any kind of design should be concerned about esthetics, the engineers as much as the architects.

My distinction between an architect and engineer is not at all based on whether one is responsive to esthetic problems or not. I think it has been too true that the engineering profession has been less responsive to esthetic questions. I would hope that it is becoming less true, because I don't think that anyone who does any design disassociates themselves from the way the design looks and, therefore, the effect on the people who look at it.

Esthetics is not something you add on, but should be an integral part of the design process and, if it isn't, then it has very little value. If it is just declaration, it is very insignificant in its use and in the long-term cost benefit of the project.

I agree that the architects have been equally guilty in not being sufficiently concerned about cost benefits so they could, in fact, sell their ideas more effectively. I think this is an essential part of the process of design. Any distinction between the two professions is that the architect is primarily concerned about the spaces that people use, at all scales from a single room to a whole city, whereas the engineer is primarily concerned with the way in which the spaces are created, the various systems that go in to creating the space.

There are some people who are both good architects and engineers. But generally speaking, these disciplines are seperated because of the difficulty in emphasis.

Mr. Sowers. I am personally somewhat of a crossbreed. I received by first college degree in a school of engineering and the second in a school of architecture and practiced engineering for 23 years.

In my particular firm, we are primarily engaged in the design of the mechanical and electrical facilities for building projects and it is a constant battle for me to educate young engineers on the esthetic quality of the structure. Some simple things that could be illustrated: for example, the thermostat on the wall behind you might just work as well if it were two feet lower and I wouldn't even see it.

I think there should be some type of program in this area to educate the engineers on the esthetic qualities of our environment.

Mr. Culver. Even though I think it is important to edu-

cate architects and engineers, I think it is more important to educate the public. I feel it is the public's pressure on the engineer or architect that made him responsive to economic considerations. I don't blame architects and engineers.

Environmental Education for the Urban Disadvantaged

Mr. Scheuer. Mr. Culver, how do you educate—you are talking about educating the public—a slum child into a concession for the environment, a child who, living in a degrading, dehumanizing environment, passes daily through rubble-strewn streets. He goes to schools that, more often than not, are old and dilapidated. In my district we still have Abraham Lincoln era schools. How do you create a sense of awareness in the beauty of life?

Mr. Culver. I am not quite sure. I know what can take place, and has been taking place, is exposure; how we could get him to receive this information and use it. I know this must take place.

When we speak of children in slum neighborhoods, we still recognize the percentage of televisions in the homes irrespective of the economic level. It seems to me that this highly significant technical instrument could be used in a way that we could be bringing this in to educate in the home.

It can't only take place in schools, even if the school is the best vehicle. It just seems that six hours spent in school is not enough. When we speak of the middle-class white person going to a hip school, he also has his home environment to deal with. He has this grass phenomena and the trees and a decent house and these kinds of things.

So I think we would have to search for very highly, significant technical instruments. I don't think that if we try to educate that child about his environment, that he can do something about it. We will have to do something about the environment sooner or later.

I think we have to go along a two-pronged trail.

Mr. Scheuer. Thank you very much.

Mr. Brademas. Thank you all very much indeed. This has been extremely helpful testimony and we appreciate it.

. . .

[*The subcommittee next heard the testimony of Carl J. Megel, Legislative Director, American Federation of Teachers, AFL-CIO. Mr. Megel voiced his support for the programs recommended by the Environmental Action Clearinghouse. However, he cautioned that increased emphasis on environmental problems should not reduce efforts in other areas such as housing, education, and social welfare.*]

Mr. Brademas. The subcommittee will resume consideration of this bill at 9:30 in this room. The subcommittee is adjourned.

(Whereupon, at 12 noon the subcommittee recessed, to reconvene at 9:30 a.m. of the following day, Wednesday, April 8, 1970).

DAY 5

House of Representatives, Select Subcommittee on Education
Washington, D.C.

April 8, 1970

During this session, the subcommittee heard from "the world's scrappiest anthropologist," Margaret Mead, and a university educator, John Steinhart. Mead's testimony ranged widely over a variety of issues related to the environmental problem, while Steinhart focused primarily on the problems of institutional change at the university level and their importance for solving environmental problems.

Mead expressed optimism about this country's capacity for basic attitudinal changes in regard to the natural environment, but cautioned that we also have a penchant for losing interest and enthusiasm once initial "solutions" are implemented. The task of environmental maintenance is a long-term, continuing, and perhaps rather boring activity, somewhat like good housekeeping. The educational system, with a new "crop" of youngsters entering and leaving each year, is one social mechanism for the continued renewal or regeneration necessary to handling such continuing problems.

Mead also stressed the holistic nature of environmental problems, pointing out that environmental problems are only one part of a greater system, which includes all man's problems and activities. Thus, urban and rural questions, poverty, racial discrimination, economic development, and many other issues must be viewed from an interconnected, "whole earth" perspective. The demands of dealing with "everything at once," are tremendous, though computers and systems models provide us with a powerful tool for doing just this.

Steinhart, who co-authored with Stacie Cherniack a report to the president's Environmental Quality Council on "The Universities and Environmental Quality," gave most of his attention to the problems of reorganizing universities to better deal with problems requiring interdisciplinary study, such as those of the environment. Steinhart described the existing barriers posed by the departmental structure of the university to interdisciplinary research and teaching. He also made a special plea for recognition of the fact that environmental problems are human *problems, not problems which can be solved simply by understanding more about nature and technology.*

The subcommittee met at 9:40 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Meeds, Scheuer, Reid, Bell, Collins, Landgrebe, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronold L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; and Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order. We shall today continue consideration of H.R. 14753, the Environmental Quality Education Act, and related bills.

Introduction of Dr. Margaret Mead, Anthropologist

We are most pleased to have as our first witness today a distinguished American, president of the Scientists' Institute for Public Information, curator emeritus of ethnology at the American Museum of Natural History, and, according to the latest issue of *Look* magazine, the world's scrappiest anthropologist. We are pleased to have Dr. Margaret Mead with us.

Dr. Mead. Mr. Chairman, I don't believe that it is necessary for me to reiterate the state the environment is in or to describe the horrors and dangers that we are confronted with if we don't do something about it.

However, I would like to speak briefly on the fact that I think we are tending to diabolize either ourselves or any portion of the community we can put the blame on at the expense of the others, instead of recognizing that the environmental crisis we are in is primarily due to the fact that the population explosion and technological explosion have crept up on us and found us totally unprepared. I think it is quite correct to call us unprepared.

I have watched primitive people in New Guinea and I have had an opportunity to look at the environmental conservation practiced by people in the Stone Age, who had a rather acute understanding of what was happening, acute enough so that they would bring their drinking water from two miles away so that it was not contaminated by burials, and who were able to think about the world enough to say that the reason people had to die is that they would otherwise be buried under their own waste.

Shared Responsibility for Environmental Problems

I think it is important for us to recognize that as people change from one situation to the other, they are unable to cope with environmental problems, so we have brought primitive and peasant peoples used to living in the country into the city, and they have thrown their garbage out the window, where previously they would have thrown it out to the pigs and the pigs would have dealt with it quite adequately.

As a people, Americans came from small, compact communities in Europe that had longstanding customary rules of how houses were built and how the community was handled into what looked to them like a wilderness which was made, in many ways, into an enemy as they tried to make their home in it. We have carried over a great many of those wasteful, exploitive attitudes, and each person is trying to build himself a small castle within the wilderness, with a tremendous disregard of what happens to anyone else.

Also, I think it has been a mistake that each segment of the community has tended to blame another segment. Industry has been blamed without the community trying to provide any legal restraints or cooperative measures to be taken together with industry. As long as we could blame industry and do nothing about it, nobody had to do anything about it. So, we have failed to recognize the extent to which the consequences are shared. We fail to recognize and look for who has the longest stake in the preservation of the environment of any community or region, and we fail to recognize that our populations have become so mobile, our inner cities have become so impotent to correct the difficulties, that we need a quite different kind of structure if we are going to be able to deal (with the environment) on a long-term basis.

You very often find that the power company that is at present treated as the enemy of the community, is the one group that may have a long-term stake in what is happening, and we ought to build their long-term stake much more efficiently into our planning.

We also have almost no way at present for getting the people who pay together with the people who benefit at any stage or level of what is happening.

Global Good Housekeeping

I think all this is relevant to the importance of widespread education and the kind of education that is contemplated in your bill, because the thing that we are going to have to face in dealing adequately with the environment—which I don't think we are properly facing yet—is what a long term, continuous, and ultimately rather boring activity it is going to be. It is going to be very much like good housekeeping, you know, and the dishes are never done. There are always dishes tomorrow morning. From this point of view, women may have something to contribute.

Mr. Scheuer. It really is global good housekeeping.

Dr. Mead. It is global housekeeping. When we discuss thermal pollution or the wreck of the oceans, or we may not be able to live here at all in 50 years, this has a fine, dramatic flavor, but once we have got past the first essential legislation, established worldwide monitoring systems to monitor problems of pollution or danger, once these mechanisms have been set up, we are going to have the problem of maintenance.

The people of the United States are particularly bad about maintenance. We have a great tendency to spot a danger, get very much excited, pass a bill, and then take our marbles and go home.

We wouldn't have Women's Liberation today if women hadn't gone home after women's suffrage was won. The scientists' Committees on Information worked very hard on radioactive contamination of the environment until the test ban was passed and then we saw a terrific slump all over the country.

The Civil Rights Movement got the Civil Rights Act passed, and then they, themselves, passed on to other things.

This kind of think won't work in the case of the environment. It hasn't worked very well in any of the other cases. The things we have treated as goals were only steps and should have been treated as such. A short-term perspective won't protect the environment. We will have every polluter back polluting cheerfully in five years unless we build structures that will last.

I think the best structure is the continuous participation of children and high school students and college students, but particularly schoolchildren in every community, because you have a new crop of them every year, and what we need to look at now is ways of providing regenera-

tive cycles for dealing with problems that are going to be continuous.

If we can build our whole appreciation of the environment and our education of the community with each new class of children that come into school, this will mean, of course, we will have to keep training the teachers to deal with the new children, about new things. Environmental conservation as it was taught 20 years ago wasn't coping with such things as nondegradable products. No one had anticipated, even in science fiction, some of the problems that we are confronting today.

But if we deal with schoolchildren who are continually alerted to the new world—in television, [which] the teachers don't have the time to look at, usually—they bring . . . new insights into the . . . situation.

[We need] widespread educational mechanisms with continual monitoring functions and ways of broadening the perception of children and high school students; that is probably one of the most important things we can do.

Bridging the Generation Gap by Cooperative Environmental Action

We have been disturbed by the generation gap and we have thought it was possibly a continual confrontation between adults and children, but actually, the generation gap that has been plaguing us now has a group of young people old enough to give some leadership. The [children] of the post-World War II generation are now 25, and they are no longer students in school. They are teachers in schools and young lawyers and young doctors, and we are building a considerable group of people now who can have some leadership and power instead of seeing themselves as helpless students, the oldest of whom was 20, over against the whole rest of the world, which was a fairly frightening situation.

We can look forward now to young leadership for one class after another of high school students who will be coming up and looking for things to do in society.

One of the troubles that we have had in the last five years is that there have really been very few things that such young people could do. They could demonstrate, they could sometimes influence a political decision considerably, but they were very one-shot activities, also. And if we once start on problems of the local environment and then expand them steadily to state, nation, continental, and planetary problems, this has enough progress in it, enough change in it, to keep generation after generation of schoolchildren active, if we have the rest of the community active and responsive to them.

So that just as we are emphasizing in the contrast between our space technology and our handling of earth at present that we have the understanding and means to recycle all our resources, but instead we are exhausting them and throwing them away as waste and rubbish, I think if we have an educational model which is as humanly regenerative as the types of recycling physical resources that we want to have, that these two things will work very well together.

There are several implications of such a model. One of them, is that I think it would be a mistake to channel too much of the funds that will be provided by this bill to the old formal methods of the educational establishment. Such education needs to be supplemented by a good many other kinds of community activities, and especially by the types of activities where there is a cooperative effort between very senior citizens who have had enough experience to have some scope and depth and young people who are coming up. This would have some implications, I think, possibly on your advisory council. I can understand why you want 21 people on it, so you get six people to the meeting, because this is the general style today of meetings with people of prominence and responsibilities.

But we have some new inventions that can deal with this. We have the possibility of now pairing every senior member of any committee or council with a junior member who will keep up with what is happening—represent his senior if the senior isn't there—so that at any meeting you would be guaranteed a reasonable number of young people in close touch with the older people with whom they were working.

Without such a mechanism, these large committees become top-heavy, and there is a terrific tendency to have a discontinuous membership with no continuity. This mechanism provides a way of feeding youthful questions into the situation.

Some Models for Environmental Education

There have been some suggestions made of a bold nature, such as that every state legislature and possibly the Congress, itself, should take a week's recess in some environmentally interesting area where they would experience the problems of the wilderness in one form or another, and devote themselves for a week to establishing a common climate of opinion about what they are talking about. . . .

In fact, conferences or seminars or workshops for training people to be exceedingly alert and contemporaneous in the present problems in the environment is one of the things we need to work on. So I was glad to see in your bill you were providing for the possibility of such things as workshops and conferences for the very rapid training of people who can act as resource people and teachers and in teachers' training.

The need, also, to have environmental models set up in environmental centers, I think, is very great, so that people can get a multidimensional view of the environment at the same time that they get a multidisciplinary view of the problems involved. There are several ways in which this can be done. We can use islands as training grounds for a large number of future teachers and ecological experts, as islands present us with a very good natural model of the whole earth.

It is also possible now to construct fairly easily types of models in museums and environmental centers where the participants or visitors can push a button and alter one part of the equation—population, resources, technological state of the country and so forth—and see how they can begin to arrive at either optima for that particular country, or total disaster if they push one factor too far.

This sort of demonstration where you have an oppor-

tunity, yourself, to introduce a runway into the system is far more educational than the sort of thing one gets in linear presentation in books.

Man As a Part of Nature

One of our principal problems is to change the whole climate of feeling so that man ceases to see himself as against nature, as at war with nature, or in dominion over nature, which has been one of the interpretations—I believe fallacious—of the Old Testament admonitions to man, and instead sees himself in nature.

Now, ten years ago we could say that it was a very good idea for urban children to be given an aquarium, and that looking at the aquarium they got some notion of a balanced environmental world. But they also got some notion of playing God. If they had tropical fish, all they had to do was to unplug electrically heated aquariums and the fish died. The notion of man as someone who can plug or unplug the system has got us in the difficulties we are in. We need a model where we are, as it were, in the aquarium, too, and depend on the balance of temperature and water and animal life and plant life within it, and some way in which we can see ourselves as an essential component of the environment.

I don't think this is advanced by returning to the models of how the American Indian lived, beautiful as it was. The relationship of the Indian to the environment was fine until he got hold of a gun, in which case he was as willing to destroy the game as any other people have been.

What we need are technological inventions to replace the ones we have. Instead of nondegradable containers, for instance, to think of a large part of the container industry as manufacturing something like ice cream cones, that you either eat or return to the soil in some useful form. We need to move forward, and not back, and we need to recognize the importance of technological devices, but within a new climate of opinion.

The Need for Worldwide Understanding and Action

The situation is so urgent that only if we educate everyone from great-grandparents to young children, are we going to be able to move fast enough—and over the entire country, so that we won't have pockets within the country where people are unable to recognize the urgency of what is happening.

There is a contrast today between what people feel at the moment in Santa Barbara and Florida, and in some part of the country that is relatively free from trouble, and a contrast between the recognition of the population explosion between the people who live on the plains of Kansas and people who live in New York City.

It is so acute that unless we find some way of combining all of these consciousnesses together—the Australians' sense of their great empty desert that is open to invasion by the "wrong" immigrants; Calcutta teetering on the edge of disaster, etc.—unless we can get these all in at once, so that the regional differences on the entire planet are combined in some kind of ethic that is comparable everywhere in the world, we will go on having the sparsely populated areas not understanding the densely populated areas, and we will go on very dangerously, possibly, to international races with GNP alone. Gross national product is a gross measure, and is only indirectly related to the problems of environmental control.

We will go on to population races, possibly, instead of establishing some kind of standards which will include resources, population, the demographic composition of the population, the number of people who are older or younger, and the state of technology.

We should make it possible to compare one country with another, not in terms of which is bigger or faster, or has a population growing quicker, but instead, discuss the way each country is coming closer to an optimum for that particular country.

I think only by the most widespread, simultaneous, imaginative, and diversified educational policy will the United States be able to take the part that it should take in this endeavor.

Can We Use the Existing School System?

Mr. Brademas. Thank you very much, Dr. Mead, for an extremely provocative and valuable statement, which moves me to put several questions to you.

I know one of my colleagues said the other day that he really didn't think this bill was a very good idea, because the educational system is so bad, and the young people were so far ahead in their sensitivity to the environmental crisis that there just wasn't much point in it. My own feeling, however, is rather more represented, I think, by your statement that we need a long-term, continuous activity, and I think you said we need to build some education into a structure that will last, beginning with schoolchildren.

So I take it you would feel that we need to build a dimension of environmental education into the existing school system as well as moving outside the school system in the form of community conferences, adult education programs and otherwise. Would that be an accurate representation of what you said?

Dr. Mead. Certainly. Our school system is very archaic, but it is all we have got. It is also the only way in which young people's insights can be put back into a continual institutional framework.

Granted that the average six-year-old child has a different perception of the world from the average 40-year-old schoolteacher, and the six-year-old child feels things, having been born here in the space age, that the teacher had to learn as an adult "immigrant" into the last half of the 20th century and may not have learned in the same way. But unless you can pour this back continually into an educational institution, it is impossible to build it into the life of the country.

We can have one demonstration school that is outside the school building that meets in museums and railway stations and airports and shows the way to greater diversification of understanding of the environment, but you can't have a million schoolchildren meeting in quite that way and expect to get anywhere. So that I think the thing to do is to revivify and inspire the educational system. We can't possibly dispense with it.

Changing Our Values

Mr. Brademas. To relate what you have just said to another point on which you commented, the question of attitudes and values, and I believe you said that we have to change our ethic so that we don't see the world as man against nature, but man as part of nature. What kinds of implications has this view for the nature of our school system? I will rephrase my question, Dr. Mead, and put it this way:

Are you saying that we really need to change our attitudes and our values generally if we are to make any effective advance in meeting the environmental crisis?

Dr. Mead. Yes. But I am also saying that this is not an impossible task, that this country is capable of very rapid changes in value judgments and very rapid changes in the deployment of energy to solve particular problems, with the mass media, and with our general volatile temperament in regard to causes and attitudes and goals. It will be possible, first by a massive effort such as is being mounted in the colleges now for Earth Day, and then almost immediately structuralizing the results of that effort. I think it would be possible to changes our values.

Let me give you a very mundane example. One of our oldest and most beautiful and most recalcitrant communities that carries on the spirit of being against any government and against the next town was very angry because a gas station was going to be put up that was going to cut down a very beautiful tree. But it didn't occur to anybody to ask the oil company not to cut down the tree, until finally somebody had that incredibly inventive idea of discussing it with the gas company. They kept the tree and built a beautiful gas station, and now you find advertisements in the national magazines of how good oil companies are keeping old trees. This is in a matter of just a few months.

Complementarity of Old and Young

Mr. Brademas. Dr. Mead, you have just published a new book, *Culture and Commitment,* in which you talk about the relationship between the youth and the older generation. What, in your judgment, explains the sudden burst of interest in the environment on the part of young people?

Dr. Mead. I think we have reached a critical position, and we have been able to say so. That is, the tremendous interest on the part of young people is a function of the operations of a few older people who have been persistent prophets of what has happened. So, you have an interaction between the young and the people who have been working on this very hard in the last 20 years. This is all in the last 20 years, you know.

We are not talking about the conservationists who did their best to conserve our wildlife and rivers and parks, although this was very important. We are talking about the sudden knowledge that the population explosion and the technological explosion have created something new and very dangerous.

If there had been no older members of the community worrying about this, I don't think the young people by themselves would necessarily have perceived all the particular types of dangers. It takes a combination of foresightedness and preparedness on the part of the old and activity and energy and question-asking on the part of the young. This was stated rather well at a conference I attended in Stockholm last November, which was a conference of Nobel Prize winners and other characters of that ilk from disciplines in which Nobel Prizes are not given, and they invited about 20 students to come and criticize our deliberations. They started out with a statement over the loudspeaker before they came in, "Your average age is 61. Our average age is 21. The waters are rising; we have no tools to build boats."

I see the task of the older generation to provide the tools to build the boats. This is what the Scientists' Institute for Public Information is attempting to do—and doing workbooks for the April 22 Earth Day, providing the technological background out of which young people can take the lead in what is happening.

Mr. Brademas. Thank you. I have other questions, but so do my colleagues here. Mr. Reid?

Recognition of Interdependence of All Parts of Earth

Mr. Reid. Thank you, Mr. Chairman, and I am very happy to welcome you here this morning. I think what you have already said here today, and indeed, in your *Look* magazine article, is more than pertinent.

Let me ask you in connection with the latter how you see our society becoming sufficiently concerned about preserving air and water? I think you touched on that in the *Look* magazine article, that we have thought a little bit in terms of village units and supplies without thinking of the basic need to preserve air and water for the individual.

Dr. Mead. I think that we have to combine our value for individuals with our value for the whole society and in the end for the whole planet; they are inseparable.

In the past, one of the ways that we have made individuals safe is to let them accumulate as much as possible of property and land and establish a series of little fortresses within which they could use as much power as Nero used in his palace in order to establish a hygienic, safe, comfortable form of life.

For individual families this is no longer tenable. It is no longer tenable for the United States to be using something like 50 percent of the world's irreplaceable resources.

We are going to have to establish forms of safety and comfort and health that don't draw so heavily on resources, and that don't have such an extraordinary polluting effect of every sort on the environment around us. So that we are going to have to devise ways of showing that the welfare of each individual is much more inextricably connected with the welfare not only of his village, but his state, region, nation, continent, and the world, than we have felt in the past, or, indeed, was true in the past.

The welfare of somebody who lived in Central Europe in the fourth century was not closely tied to an Inca Indian in South America. They were totally out of reach of one another. So, this is a new situation, too, and we haven't the ethic of valuing in each individual which fits the degree of interdependence of the individual in the whole world today.

Extent of Environmental Hazards

Mr. Reid. Do you think there is a recognition that there are finite resources, for example, that we may have ten years left in terms of the air we presently have, that we might run out of water in the United States in the mid-1970s, that we could have a worldwide famine if we don't do something about population control very rapidly, that at the rate we are moving on DDT in the federal government, we will perhaps eliminate most of the species on the earth by 1975? Is there a growing recognition that there is great urgency, and that there are very definite limits to our planetary resources?

Dr. Mead. There is growing recognition. I am afraid we will overstate the point until it looks like crying "wolf," and nobody will believe it. I think that is what has happened to the older generation, and what we need is a young shepherd who never heard anybody cry "wolf" before.

I think we ought to be careful to make minimal statements. We know the population will double to something between six and seven billion. Let's not argue as to which it is going to be, plus or minus 300 million. Take the minimal figure, it is quite bad enough. If we take the minimal figure at every point—the possibilities of more oil slicks, thermal pollution along the East Coast, the effect on the total atmosphere of changes in temperature, and the possible pollution of the oceans—if we take the minimal figure in each case that everybody agrees on, we will build a picture that requires sufficiently urgent action, and keep the extreme alarmists from overstating their position.

I think Jean Mayer's point, that we are not going to have a terrible famine by 1975 that will wipe out half of the world population, but we need be more worried than if we were going to have a famine because we will have food enough to just make them sick, and make the whole character of their life qualitatively poor, and this is the terrible possible menace, that the quality of life will sink and sink without any arresting total disaster.

There are too many people around at present who don't mind total disaster. Americans never really have minded total disasters, if you don't know what hit you. That was our initial response to the bomb when I did some interviewing the day after Hiroshima. The first thing Americans said was, "Well, you'd never know what hit you."

With that approach, if all we are going to say is something is going to hit us and we won't be here to know it, I think it would be rather dangerous. Americans didn't start worrying about the bomb until John Hersey wrote his book on Hiroshima and Americans realized that doctors and nurses won't be there. You might lie there suffering for 24 hours before you died. Then we worried.

Now, if we make total disaster pictures, people say, "All right, live it up, that is all there is, nothing to work for, and we are going to be choked to death, strangled to death, smogged to death pretty soon anyway."

But if we say, "Life is going to get steadily worse, but we are going to be here"—[laughter].

Mr. Reid. I am sure we are going to be here. . . . Thank you, Mr. Chairman. . . .

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer I want to welcome you here today, Dr. Mead, and say that some of the great experiences of my life were two successive summers in the ancient Greek amphitheater at Delos watching you declaim to the gods on Mount Olympus your environmental ethic. I might say you not only stamped it indelibly in my memory, but last summer, as you recall, we had the first conversations that led to the bill we are now discussing. So, I am eternally in your debt as a student.

Is Environmental Concern a Cop-out from Other Problems?

A couple of questions: we have been troubled by the feeling in the poor and the black communities that the new interest in the environment on the college campuses is a cop-out from the urgent pressing problems of cities; that it is a middle-class white phenomenon which really isn't relevant to the poor, the minorities, and the blacks.

How do you think we can present this as not a cop-out, but rather as something that goes to the very core of the problem of making urban life not only tolerable, but attractive and interesting and pleasant for everybody, especially for the poor and the blacks who live in the worst part of the urban environment, and who in many ways are the greatest sufferers from our depredations of the environment.

Dr. Mead. You know, we find the same thing, Mr. Scheuer, when we have an international conference. People who come from communities that don't have running water yet say they aren't worried about detergents coming up to the 16th floor of an apartment house. As far as they are concerned, getting water piped into a community is valuable. We have the same dangers of lack of understanding from people who have not been overwhelmed by the new technology as we have from people who are contending with the results in an impoverished artificial environment.

I think we have got to do the whole thing at once. We have got to face the man-made environment of the inner-city—which is essentially man-made, it is dangerous, and bad and it must be remade—at the same time that we talk about Yellowstone Park or what should be done about those bears that have to be re-educated so that they won't eat out of garbage pails any more—which I think is fascinating, but I can understand a poor mother with five children with no shoes and likely to be eaten by rats not being concerned about the bears, or even their long-term re-education! We have to talk about both things at once: how the rats are driven into the cities when you burn the countryside, as has happened in Vietnam, and then in the cities you get plague. We have to talk about the interrelationship between the depopulation of the countryside with soil erosion, the way in which we are handling new machinery in the country, which drives people into the cities, which drives them into poverty. We have got to talk about all those things at once.

The problem of talking about everything at once is something that we have never been able to solve in the past, but that we can do now with computers and with complex models, so that it is perfectly possible to show that as you pile people up in the cities you then get effects on the atmosphere, for instance, and smog, which react backwards; and you can relate back and forth, never

forgetting the people who are suffering the most now. . . .

Use of Nonschool Educational Institutions

Mr. Scheuer. . . . In your answer to Congressman Brademas you said that we had to work with the school system, that it was all we had, and that we had to bring it into the 20th century.

In your opening remarks you discussed working not only with the education establishment, but also with other community groups. Can you give some specifics that we might write into the bill or into the report that accompanies the legislation about non-education-establishment foci of education on the environment, both urban and rural? What are these nonschool institutions through which we could work?

Dr. Mead. Well, there are, of course, other establishment institutions, such as museums and science centers and children's museums, special programs developed by industries with particular scientific commitment, science fairs, all of these established nonestablishment, or established non-educational-establishment institutions.

I suppose—and I don't know whether it would be too difficult; I am not an expert in writing congressional bills —if you could build some kind of balance into the picture; that is, if you could say if you want money for your own school system in this community, state, region, whatever is the useful unit, you need also some balancing adult education.

So, it could be said to a school system if you can come up and say, "we have done all this for the elementary school," the reply would be "then you get money for a balancing effort out in the community," something of this sort which would move toward including all ages, multidisciplinary, multi-institutional activity.

I don't know whether that would get us into the kind of finagling we get into where we would just bootleg adult education—we are such wonderful bootleggers—but some form in which a community is rewarded. And the more it does, the more it is rewarded, and it realizes if it lets something slip—you see, as Newark was proposing to close its museums, and we went through a period last year in New York where the first bright thing we thought of doing to economize was to cut down on our appropriations to those institutions where the children are going to learn something which might be relevant to having a city where you would not have to economize in this way.

So, if we could bring rewards to a community that is doing something closer to the community, and also penalties, I think this might be an advantage.

Ecological Models

Mr. Scheuer. One last question: You talked about the application of computers and complex models to parts of the environment.

Don't you think it would help if you could get your colleagues in the universities, the engineering schools, and industry to give us some scholarly measure of the environmental trade-offs we make when we opt for more population, more automobiles, more hair dryers and electric toothbrushes? Shouldn't there be a scientific, unemotional cost-benefit measure that we could apply to all of these things to dramatize the effect of extra GNP, extra so-called convenience on the quality of our lives in an unemotional way?

Mr. Brademas. Would the gentleman yield?

Mr. Scheuer. Yes.

Mr. Brademas. I was going to ask a similar question. I take it you would not quarrel with a supplement to your question by saying, why can the computers not be used to simulate the variants?

Dr. Mead. And also to show the effects of choices we have to make.

Mr. Scheuer. And when we know that there is no way of producing power, either by the fossil fuels or by atomic energy, that doesn't have environmental fallout, we are realizing that we have to make a decision between a sacrifice in the quality of our water and the quality of our air or an additional convenience such as the electric toothbrush. I am very impressed by your unemotional approach of not overstating things, of not uttering wild, unfounded suggestions of dire calamity, indeed, of not losing our credibility.

It seems to me that we must include in our scientific thinking consideration of the actual trade-offs that we are making in our decisions. I ask you as a scholar who believes in the empirical method, cannot the computer, cannot science, reason and the university and industry's talent be applied to make the trade-offs evident to all of us?

Dr. Mead. It can. I think we have to press on doing things from several levels. We need a good simulation now of this planet at the very least, and its place in the solar system. Unless we do that, we are not going to judge accurately what we do with changing the nature of the oceans, for instance, and possibly irreparably, or possibly setting up planetarywide activities, so that we need a simulation for the whole earth. This does not exist.

We do not have the whole in which to instill the parts, and you are not going to be able to talk about the effect in the United States of so many hair driers or electric toothbrushes or whatever, and the minerals they use and the nondegradable products that they result in, without this wider context, also. So I think it is necessary to have a series of computerized simulations that will show, if we go in the direction of more roads and roadbuilding instead of housebuilding, what this means also in encouraging more automobiles with one person in each, polluting the atmosphere and providing junk heaps, as compared to planning new kinds of cities with much smaller-sized individual transport, but maybe much larger and better city-to-city transport, so that we can see housing and transportation draw differentially on our resources and result in different kinds of contamination and waste, but both of them can be related to our knowledge and human resources for a better way of life.

Mr. Scheuer. Where would you say this environmental earth model ought to be?

Dr. Mead. The whole earth model we had better start working on on a national basis. We are beginning international monitoring now, which is very important. We

have international weather monitoring. We need international things going at once; but for education of this country, if we have a reasonable earth simulation, . . . then we could move down so that each small community could build a simulation of what is going to happen to it if something doesn't change up river or they don't stop doing something to their own beach.

Mr. Brademas. Mr. Bell?

Mr. Bell. Thank you, Mr. Chairman. Dr. Mead, I also want to welcome you before the committee and comment on your very excellent statements.

Ecological Schools and Island Training Centers

I wonder, inasmuch as my colleague, Mr. Reid, mentioned the problems we have immediately facing us of a concrete nature involving pollution, whether you would favor such a program as advocated by Dr. Libby of UCLA. He suggested that we establish a school of ecology—in effect, a school in which we train specialists in this field, as we would train a doctor for medicine—that we have a program such as "medical school" for ecologists. Do you think this would be one of the better alternative ways of attacking the problem specifically?

Dr. Mead. I think we need a number of such schools. Our resources at present are rather poor, and we have to deploy them as widely as possible. There have been schools of ecology that have totally ignored human beings. There have been schools of human ecology which have totally ignored the environment.

There are institutions where the public health emphasis is extreme but many others are completely ignored. I think we need more inclusive ecological centers than any that we have yet established, and I would like to see them set up with internships on islands.

At present, I don't know any better way of really educating someone to understand an environment than to give him a small island with a real problem to solve on it; and most of the islands of the world are in terrible trouble, so they could use a large number of interns working on their problems of conservation, of balance, of new crops, of protection of the soil, migration of population, and so forth. They have got everything to worry about, and we could connect them into a series of ecological centers where people were trained. We are going to have to do it if we are going to do anything really in the schools.

Things don't start in the schools. They have to start at a high level of understanding, and then we have to put it in a form that people can understand, especially now when the children grow up with so much more experiential insight into the whole world than their teachers have.

So, if I understand your question right, I think that one of the possibilities of a program such as this envisaged in this bill would be the encouragement of such schools, where a new kind of—I don't like to call him a specialist, because he has to be extraordinarily inclusive—but a new kind of practitioner in the task of preserving the world is trained.

Reasons for Youth's Concern

Mr. Bell. Dr. Mead, in answer to Mr. Brademas' question, you mentioned youth's concern for ecology and why they seemed to take this banner up so quickly. I wonder if you would discuss that a little further. Why is it that they would take this matter up when there are so many other things they could take up, too? I realize the importance of this, but there are other problems, such as poverty in the cities and so on. Why is it that they seem to grab at revolution against organized society, the military or something of this kind? Is that the basic background behind this?

Dr. Mead. I don't think this is taken up for those reasons. I think we have to allow a little for the drama, and that you are unlikely to get a nationwide cause out of something that has no dramatic potential, and we have quite often found that fear of contaminants in the environment is a disguised fear of a nuclear war.

We did some studies just before the first pesticide report was released, and we found that what people were actually talking about most of the time was a fear of total annihilation, and they talked about it under the heading of what DDT would do to you, or something of this sort.

I think there is a very widespread feeling among the young people that we may be on the verge of catastrophe. It is very startling to talk to the head mistress of a girls' school—a school for children of the privileged, and a girls' school to which they send the gentler girls, who might not stand up to bigger schools—and when I asked her last year what was the prevailing mood of the senior class, . . . she said, "Despair." These are 17-year-olds living in a city where they, themselves, had every privilege and possibility.

Now, I think that the problem of environment gives hope, while it expresses the despair. If you think about the fact that you don't want the oceans polluted, that you do want living creatures to continue on this earth in some kind of balance, that you want to conserve the soil, that you want to get a balanced population, then you are thinking about the future, however much you may be battling against the enormous wickedness of the contemporary use of things.

International Problems and Cooperation

Mr. Bell. One more question, Dr. Mead. I gathered, also from your comments, that you feel in some cases the whole battle against the problems of ecology should, as much as possible, be internationalized and one of the great writers of Sweden made this quite clear. He thought that one of the most important aspects is for us to try to internationalize as much as possible. Would you concur in this, that this is a problem that has to be dealt with internationally?

Dr. Mead. It has to be, because oceans wash against different shores, and as I once heard the head of the Air Force Academy say, when you got a few miles up, the boundaries between nations didn't matter much.

Sweden is in a particularly good position to appreciate this fact. We are not in quite as good a position. It isn't demonstrated to us so often. It is perhaps unfortunate that the major example of which we must take account comes from the fact that we are extracting extremely valuable and irreplaceable materials from other nations for

our benefit, and when we export benefits such as new kinds of seed, we are also in danger of exporting fertilizers and pesticides which will spread environmental imbalance in other countries.

It takes a greater act of the imagination on our part to realize how international this problem is than it does for Belgium or Holland or Sweden. That is perhaps the reason that Sweden is taking the lead in preparing for the big United Nations Conference on the Environment in 1972, which, I think, it is very important that the United States should support up to the hilt.

Mr. Bell. In view of what you just said, and in view of the selfish problems that many nations, including ours, face, do you see any prospect of internationalization really happening with any rapidity?

Dr. Mead. I think so. These are the fields in which cooperation has been easiest. Antarctica, which is essentially an environmental piece of cooperation—12 nations have been involved in handling Antarctica in a way we have never done before.

The whole weather satellite program is one in which there has been a great deal of international cooperation. Here, I think, it is important to realize these are not the problems of capitalist countries alone, that socialist and communist countries have been no more successful than we have in solving the major problems. They have sometimes been more successful in getting a good-looking center of the city, but when it comes to the contamination of water, to smog, to dangers to the soil, to the handling of wastes, they aren't doing any better than we are. These are not problems of a particular ideology or a particular economics system; any time this is so we have a much better chance of international cooperation.

Mr. Bell. Thank you, Dr. Mead.

Mr. Brademas. Mr. Meeds?

Mr. Meeds. Thank you, Mr. Chairman. Dr. Mead, this has certainly been a rare experience for me. It is my first occasion to hear you speak, and I am very impressed.

Ecological Laboratory

And your testimony has made me very proud of my own congressional district, because the type of laboratory about which you spoke is in being in the Second Congressional District of Washington. A 586-acre site, controlled by a consortium of 21 school districts, colleges, and universities, the Department of Natural Resources—one of the colleges being Huxley College, which is an addition to Western Washington College—[is] totally dedicated to ecological study.

They are running this 586-acre tract with the ideas that you have expressed here: manipulation and alteration of the environment, experimentation, collection of laboratory specimens, projects and demonstrations, forest management, conservation projects, such as study of erosion, air and water pollution, devising environmental curriculums, and teacher training in the whole subject of environment.

They have been at this, now, for approximately eight months, and are very interested in this legislation, and we are hopeful we can pass it so we can give them financial aid. So, I just wanted to report to you that the type of things you are talking about, in this small way, are presently underway.

Avoidance of Other Social Problems?

But that is not my question. My question is: I have the same fear that Mr. Scheuer expressed a little earlier, and that is that I feel our concern about the environment today is largely a middle-class ethic, and that we are failing almost completely in our concern about environment to take into consideration the more basic problems of the cities and the urban areas of this nation.

We are really not relating to those problems when we are talking about environment. The average person that talks about environment is not talking about the rats in apartments in downtown Washington, D.C., and he is not talking about the garbage and the filth on the streets and in the alleys and in the hallways of people who are actually living under these conditions.

So, my question becomes one which would try to elicit from you the kind of fear that we can make this bill, perhaps, more responsive to that problem. Maybe I am incorrect when I ask the question. Maybe this is not the case, but I feel it is.

Dr. Mead. There are people who are saying so. There are a lot of people who enjoy producing endless red herrings by saying that we are doing something instead of something else. There is a group of people in this country who say that the whole environmental ploy was invented by the establishment in order to take the students' minds off the Vietnam war. I am old enough to remember that there were people who said that Lindbergh crossed the Atlantic in order to take people's minds off the coming depression. I think such accusations are a typical form of American political activity, but it can be overdone.

I do not think something is bad because it comes from the middle class who happen to be in colleges with time to think, and I don't know who is going to do the thinking if it isn't done by people who have time to think, and I think to brand any activity as either black or white, rich or poor, middle class or upper class or lower class, or no class, or hippie, doesn't help very much.

I think what we have to emphasize—and what we don't do enough of is emphasize—the wholeness of the problem. This is partly because the conservation movement got combined with the antipollution movement, and so we have all the bears in the picture. We must emphasize that man is building himself an environment, that we must not merely conserve air and water and earth, but we must build the place we live; and most of us live in an artificial environment, but we must build this with due regard for all the resources and the handling of the natural environment.

We are condemning humans to live in a dangerous physical environment. We can't keep them separate. Some people now insist that "every prospect pleases, and only man is vile," or complain, "Isn't it awful that we are going to the moon when we are not doing anything on earth?" and "We are thinking about the wilds where the middle class like to go, while the poor are sweltering."

I don't think we should deal with these dichotomies. The

country is rich enough in intelligence and resources to do all of these things, and the more we do of one, the more we will be able to do of another. We should not regard our present resources as if they were gold pieces and we have only ten, so if we put two into this we can't put any into something else, because the healthier the country is—the more people who live in the ghetto who have decent jobs and are able to buy things and keep the wheels of commerce turning—the more financial resources we devote to improving the environment.

Encouraging a Holistic View of Environmental Problems

Mr. Meeds. That is my question. How do we get the whole concern about environment to touch on the things you just mentioned? I personally do not think it is now, and I am seeking your advice on how we might make it more relevant to those problems.

Dr. Mead. When you recapitulated all the things that are being done within your constituency, you didn't say much about human beings.

Mr. Meeds. And unfortunately, that is one of my great concerns about it, because I personally feel that they are going to go off out there in their 586-acre tract and study the environment and pollution and a number of other things; but they are not going to think very much about the people in the core cities of this nation who have an environmental problem, but one which is—and I don't say it is different, because it certainly is very similar—but one which is certainly more pressing and more volatile; and I would like to get your advice on how we enlarge this study of environment about which there is so much concern today and so much ingenuity and effort, how we enlarge this and also make the study of our cities and the problem . . . [of improving] our cities a part of it.

Dr. Mead. I wouldn't use the word "also." I would simply say we have to put ourselves inside the system within which we live. And if you live in a nice remote meadow somewhere in a low-populated state, you must learn to see [that] you cannot cut yourself off from the big cities nearby, or even the small cities, with slums, waste, pollution. The two things are totally interrelated.

That is the reason I don't want to talk about the environment without talking about hunger, because I don't think anybody is going to care what happens 50 years from now if they are uncompassionate about the fact that people are starving in the United States right now. And I think that is part of our handling of the environment.

Mr. Meeds. It certainly is. Thank you, Mr. Chairman.

Mr. Brademas. Mr. Collins?

Mr. Collins. Thank you. I have no questions. I am glad to have a witness who speaks extemporaneously so well.

The Role of Museums in Environmental Education

Mr. Brademas. I know Mr. Hansen has a question or two. And because I have a couple I haven't put to you, I will put them to you.

You have been identified for a number of years with museums. What kind of a role can museums play in the United States in environmental education?

Dr. Mead. I think museums are in somewhat the same state of mind as the rest of the nation is. They want to break out of whatever walls they are in and expand and become relevant. So they are very ready to relate themselves more widely to a wider constituency, both in the local neighborhoods [and elsewhere]; and like most institutions of learning, they are located in bad neighborhoods and close to slums. They are ready to include the immediate neighborhood in an understanding of the environment, which means just the sort of thing that Mr. Meeds was talking about and that Mr. Scheuer has been discussing. That is, they can become centers where discussions of the modification of the immediate environment can become part of their activity.

Also, they can do a great deal with extending what they are doing right about the environment out over the nation in different widespread ways. In my new hall, for instance, when I build dioramas, I am building them so the top will come off and they will be on wheels, so it can be immediately put on television.

We can think of museums not only as a place where children come in enormous mobs in buses and perhaps see something, but also as centers of dissemination of information and of a much more living relationship to their constituency.

Mr. Brademas. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman. Let me join my colleagues, Dr. Mead, in expressing our very sincere appreciation to you for your help this morning. I think you have made an enormous contribution to these hearings, for which we are most grateful.

International Monitoring

I was interested in your reference to the international aspects of the problem. We have been referred to by Van Loon in his *Geography* as "fellow passengers on the same planet," with a responsibility to be concerned for the welfare of all earth inhabitants. In looking at the international aspects of the problem and our obligations, what mechanisms or organizations or institutions that reach across national borders might we look to to help attack problems of pollution, degradation of the environment on a global basis?

Dr. Mead. I think the first thing we need is monitoring. We need to have institutions that have surveillance over what is happening on the entire planet, that can simultaneously take in information about changes in temperature in one ocean and another ocean, about the movement of birds that give us indications of what is happening in different parts of the world, so that we have the sort of international monitoring that could grow out of something like the International Biological Program that has been going on.

We need interscientific human instrumentality, that is, groups that will be monitoring what is going on. And we need the location of listening posts that are internationally responsible around the world, the kind of monitoring by air that is now being proposed. Then we need models into which this data can be fed, so that it is available to people in different parts of the world.

I think this means a concept of an international university that is not located in one place but is a network of institutions, each international in character, that extend over the surface of the earth. And, of course, concretely right now it means adequate preparation for the United Nation's big conference on the environment in 1972. This provides the kind of focus for the preparation of materials and the devising of new institutions, which is what we need.

Interdependence of Urban and Rural Areas

Mr. Hansen. I have another question or two. I might say I was particularly pleased at your reference to the cities and your emphasis on the need to keep people in the rural areas, which I agree with. And I would hope that in this effort we can clearly identify perhaps some specific ways in which we will be able to increase economic opportunity in rural areas.

It seems to me that we benefit in both ways. The migration to the cities has not only caused a deterioration of the conditions that contribute to quality of living in the cities, but it does damage to the rural area at the same time. As the villages are abandoned, the windows are broken, the stores become vacant, we see the same deterioration that we have in the cities. Would you care to comment further on this aspect of the problem?

Dr. Mead. I think there are two elements here that have to be taken into account. One is our relationship to newly industrializing countries in the post-World War II period. We put far too much emphasis on heavy industry and manufacture of goods for export, and too little emphasis on rural areas. Almost nothing was done for agriculture, and almost nothing was done, comparably, at least, for housing.

Housing and the human settlements have never been regarded by economists as part of the productive process, so they have been regarded as a form of consumption that sometimes helps the building trades, but they have not included them as necessary costs in a society if you are going to have a good life.

You define the "good life" by GNP, but you don't put any kind of housing or human-settlement planning into it.

One of the emphases of the science of human settlements, of ekistics, that I think is important, is we emphasize dealing with the smallest rural community, with a little migratory group of people living in canoes in the reeds, all the way up to the city, and do not put urban affairs over against rural affairs, put them in separate agencies, and put them in competitive situations.

In the 1930s in this country we had a subject called "rural sociology," and the people who worked in it never read anything about a town that had more than 2,500 people in it, because this was the definition of the Department of Agriculture. This was rural life. Unless we can now take the whole thing together and think about the effect on the country and on the city, and also have a rather new concept of the city—that is, that what we anticipate in the future, that whereas the man once had to wall his town to keep dangerous nature out, he may have to wall a few pieces of the wilderness to keep dangerous man out.

But for the most part, we will live in widespread areas that have urban facilities for transportation, education, and at the same time we will contain agricultural areas within them, and . . . the old notion of the compact city, ringed by suburbs, and then by exurbia, and then ringed by terribly prosperous agriculture, or terribly poor-maintenance agriculture, will disappear. And we will be able to include rural areas in a wider complex, so we won't have the dreadful contrasts between the very poor subsistence rural life—which has no possibility except sheer escape on a bus to New York, San Francisco, or Chicago—and what we call urban life today.

Unless we can think of them all at once—think of the welfare program of this country as a national problem, so that we don't have the rush of people from debilitated rural area into the cities and into cities which have no relationship to them regionally—unless we can do this, we will have the horrible deterioration of both the rural areas and the urban areas that have been outdated, because we don't need those crowds of people around the gates of a nonexistent factory anymore.

Mr. Hansen. I assume from your comment that one of the first places to start is back in the rural areas.

Dr. Mead. Back in the rural areas, exactly.

Minigrants for Environmental Education Programs

Mr. Hansen. Let me ask one further question relative to the implementation of the grants anticipated by this bill. It is my understanding that you were involved in the development of a system of handling so-called minigrants, the Acorn Program in the Department of Justice. Do you think that format might fit this bill?

Dr. Mead. I think it is very lively and very stimulating. I think that a minimal amount of structuring is in order. But the way we have got government grants set up at present, you take two months off to write the proposal for the grant. We are using up more valuable research and innovative time in writing grants in this country instead of working on the grants. This is true: the larger the grant gets, the more necessary it is to have these large proposals.

Also, they get concentrated in the hands of people who know how to write them. And so even for a minigrant sometimes you get a book by people who have enough money to pay people to write the books.

Now, if we could simplify this—and especially if you want to get different kinds and sizes of communities into this, and different community forces—I think minigrants where people could just take off on small experiments would be very useful.

With the environment, there are so many things you can do. You can start work right from your backyard or your block, test the air in your own street, or work on the lead in the paint on the walls in the old tenement right where you are. And it is not necessary to work on a world scale, especially for the children and the local citizen to find out what it is all about. In the end, you are working toward establishing a sound, informed citizen backing for the necessary steps that have to be taken by the nation and the world community. And I think minigrants, with a minimum amount of red tape and professional expertise and jargon, are one way of approaching this.

Mr. Hansen. If we considered amending this bill to limiting the grant application to one page, it would be a step in the right direction.

Dr. Mead. Yes, but I wouldn't want to interfere with an individual's right to write long reports like that.

The Role of Churches

Mr. Brademas. I want to put one more question to you, because I am familiar with your work in the World Council of Churches.

Do you have any comment to make on the role that churches might be playing with respect to the whole environmental crisis? I have raised this, obviously, because of your earlier comment on the importance of attitudes.

Dr. Mead. Well, we are very hopeful that the churches will supply one of the principal ethical impetuses to what needs to be done. The World Council of Churches in the period before 1968 spent a great deal of time discussing such problems as man's economic organization for fairness and justice in the world. And for the next seven years the group on church and society are working particularly with the place of man in a future-oriented technology-based society—in which technology is a necessary component—and the relationship of that technological progress to man's spiritual and human welfare. That must be taken into account.

There are some quite serious problems involved, because in many of the orthodox positions, technology has simply been regarded as a simple enemy of spiritual life. Any tool invented before the birth of Christ was regarded as good and appropriate for a figure of speech in the sermon, the sail and the plough, and things like that. Anything invented since then has been regarded as the devil, with the computer now leading in this field. We have a dangerous break in society between those who feel man's spiritual life is permanently endangered either by technological advances as a whole or by the kind of thing Mr. Scheuer was talking about, where we spend our lives getting new kinds of hair driers and electric toothbrushes and two five-passenger cars.

What we are trying to do is bring the two things together, to bring together the churches' concern for human welfare—bring together the churches and the synagogues to involvement in man's relationship to man and man's relationship to nature—and responsible attitudes toward technology, so instead of having either a kind of humanistic or spiritual battle with, or avoidance of technology, we will take responsibility of what we do with technology. We will recognize that the Sabbath was made for man and not man for the Sabbath, and that we are letting technology take the lead in many cases instead of the value of human beings taking the lead.

One of the interesting devlopments here has been the reinterpretation of the phrase of man "being given dominion over the earth," as it has been recognized. That has too often been interpreted as the right to exploit it, and we need to include the older image of man as being responsible for the earth and all the living things thereon.

Also, in terms of ecumenical movements, this is one of the areas in which you can get cooperation, and it is in fact one of the active areas in which there is active cooperation going on now between the Vatican and the World Council of Churches. We will have no more purely Roman Catholic or purely Protestant commissions in this whole field. They are going to work together from now on. And, of course, with greater understanding with the Far East and with other countries, we need an enlarged spiritual evaluation on man in nature and man's responsibility for this earth on which he lives, and the relationship of man to man within this environment that sourrounds us.

Now, the churches are one of our enormous resources. They, to begin with, have a certain degree of humanity in that they include young and old and both sexes within their bounds. And they are working hard to include all races and all classes. You have a great uproar going on in the churches today, where people want to be more relevant, want to find things to care for, and where there is a great deal of experimentation on man's relationship to the whole natural world.

So I think the churches should be one of the principal ethical energizing resources for what we want to do in this environmental field.

Mr. Brademas. Dr. Mead, you have been, not to our surprise, informative, provocative, and indeed eloquent. And we are grateful to you for having come to be with us this morning. Thank you very much.

Mr. Scheuer. I want to add to that, Dr. Mead. We have been troubled by the generation gap. But you as an articulate American have helped us to bridge that gap, and we thank you for your help.

Introduction of Dr. John S. Steinhart, Professor, Institute of Environmental Studies, University of Wisconsin

Mr. Brademas. Our final witness today is Dr. John Steinhart, director of the Marine Center at the University of Wisconsin. He is co-author [with Stacie Cherniack] of the report "Universities and Environmental Quality" for the president's Environmental Quality Council.

Dr. Steinhart, we are pleased to have you with us here this morning, sir, and invite you to go ahead.

Dr. Steinhart. Mr. Chairman: . . . I will talk primarily about the role of higher education, not because it is the only important role, but because it is the one about which I know the most.

Conceptually there are three tasks in searching for solutions to our environmental problems:

First, we must seek a better understanding in detail and in the broad general sense so that we understand not only the technical details, but how various problems are interrelated and solutions therefore dependent one upon the other.

Second, we must search for particular and general solutions—whether technical ones, statutory ones, or social solutions are indicated.

And, finally, we must encourage . . . the discussion of our collective and individual goals for our society so that the search for environmental quality does not become a collection of prohibitions but includes in it such general goals for a better quality of life as are common to all Americans.

Setting National Goals

It is in the third task, however, where the colleges and universities of the nation may play the most important and perhaps crucial role in dealing with our environmental problems. The environmental concerns go far beyond the mere wish to remove irritants from our surroundings. Feelings about the degradation of life and dehumanization of individual occupations will not disappear even if water pollution and air pollution are suddenly terminated or brought to an acceptable minimum.

We must stop inquiring at some time where our blind devotion to a century-old attitude of unbridled growth and exploitation are leading us and inquire instead where it is we wish to go and what kind of lives we wish to lead.

The president almost a year ago appointed a commission on national goals. Such a commission is itself a recognition that we do not possess, at present, a clear idea of the common goals of all Americans nor do we possess any positive programs that will lead us there.

But I submit that national goals are not arrived at by presidential commissions, but by widespread discussion openly held across the nation. Colleges and universities are so spread across the nation in small towns and large cities and have a tradition of conducting just such discussions and, in the case of land grant colleges like the University of Wisconsin, also a tradition of including citizens from all parts of society in these discussions through extension services and other direct participation.

I suggest that the bill currently under consideration could be an important piece of legislation in urging this discussion onward so that after a period of such free discussion of our common goals in society it may be easier for the federal government as well as government at other levels to select those common purposes which should become part of our political aims.

Need for Reorganization of the University

Unfortunately, this discussion does not proceed very rapidly at present. Our universities are badly in need of change and reorganization. I am told that Congress is similarly in need of reorganization and that such a reorganization, in the Congress, confronts considerable difficulty.

If is difficult to reorganize the Congress, it is at least as difficult to reorganize the purposes of the universities. They are bound by tradition and devoted to the narrow technical expertise presently represented by—and I am afraid embalmed in—the narrow disciplinary departments.

Warren Bennis remarked in a recent article that a university was "harder to reorganize than a cemetery." As a man who has tried for change from the position of vice president of a major university, Dr. Bennis was expressing just the frustration I have alluded to.

Those at universities who are anxious to get on with difficult multidisciplinary problems, like those related to the environment, need the help of Congress, and need bills like this one to make available to them funds that will help break through some of the traditional rigidity and enable those who wish to, to get on with solving our present-day problems.

Let me raise one or two questions which it seems to me are of crucial importance and yet find no place in the usual college or university structures:

With rapidly expanding technology, we know that each new advance brings with it certain side effects, some desirable, some undesirable, and some unpredictable. Considering all these side effects and the rapid rate of change, are things getting better or getting worse?

The finite size of our resource base and our planetary environment have begun to concern us. Are those problems and challenges qualitatively different from what they have been in the past?

Most of the environmental questions confronting our society contain in them complex technical considerations—although not necessarily narrow specialist ones. Is it possible to have a free society or even a representative society when large portions of the citizenry do not understand the technical issues, and, considering the rate of change, are not very likely to in the future?

This list could be expanded endlessly, but I think the point is clear. New kinds of questions ought to be at the central focus of educational programs. I assert that at present they are not.

Commitment to Institutional Change by Recipients of Federal Funds

I urge this committee to pass this bill and either in the bill or in the instructions to the granting agencies to look carefully at applicants for monies appropriated to ascertain whether the applicants have a commitment to working on these problems or simply wish to acquire monies to do what they have been doing all along.

Last year, at the request of the president's Environmental Quality Council, I participated in an investigation of environmental quality programs at universities. My associate was an undergraduate from the University of California. Our report was published in September of 1969, entitled *The Universities and Environmental Quality*. In that document we stated our findings that there were indeed a wide variety of college and university teachers prepared to move in new directions but hampered by the lack of federal funds and by the conservatism and traditional resistance of their own institutions.

Speaking now in behalf of the group at the University of Wisconsin, I can say that with the help of administrators in our own university and the interested members of the faculty, we can solve the second problem if you can help us solve the first.

I urge that this bill be passed and that the fund-granting agencies under this bill look carefully at the commitment of both administrators and faculties who apply under the titles of this bill, to see indeed whether they are this new kind of teacher that is needed—one as willing to learn as to teach and one clearly devoted to solution of society's problems, whether or not all aspects of the problems fall within his particular traditional disciplinary focus. It is important to inquire whether we are dealing with people who are merely seeking funds to do what they have been doing all along.

Need for More than Training of Professional Scientists

The content of environmental education—and I grow increasingly uncomfortable with that term—is not at all clear at this time. We are in desperate need of ecologists in the sense of ecology as a discipline, but we need many other things as well. The root of many of our problems is in technological side effects, or for that matter, in our long-time devotion to unbridled growth of consumer goods, of consumption, and of population. We should not, therefore, devote all our efforts to producing more scientific ecologists. We shall need social change and new kinds of government regulations and structures.

Garrett Hardin, over a year ago, illustrated very clearly that some of our problems, in particular population growth, not only do not have technological solutions but cannot have technological solutions. This leaves only the option of social change and government regulation for whole classes of problems. A part of the educational process will need to be the communication of this fact and that we cannot sit around, Micawber-like, waiting "for something to turn up."

Finally, gentlemen, we need the open discussion of alternatives for our future. We have already begun a period of rapid social change. The report of the young Republican Congressman visiting college campuses a year ago, or simple observation of a college campus, or reports of young people's activities in the newspapers can persuade us that this is so. This odd behavior and the strange culture among our young people is not the result of some massive biological mutation, but a response to the very real problems and dissatisfactions which in somewhat more muted ways trouble us all. The kind of open discussion of future alternatives in the way we live with ourselves and with our environment is bound to make some of us uneasy. Those of us over 30 or 35 are likely to be most uneasy of all when longstanding ideas and goals of our society are challenged—and I am told that a majority of Congress is over 30.

Nevertheless, I think we can join in the effort to put the idea of man back where it once stood, at the focus of our lives, and in the words of Archibald McLeish, "to make the end of education the preparation of men to be men, and so to restore to mankind—and above all to this nation of mankind—the conception of humanity with which humanity can live."

Thank you for your patience.

Mr. Brademas. Thank you very much, Dr. Steinhart, for a most helpful statement. I am going to ask unanimous consent, which I think will not be challenged, that your report, *The Universities and Environmental Quality*, be included as part of the hearings.

(The document follows:)

THE UNIVERSITIES AND ENVIRONMENTAL QUALITY—COMMITMENT TO PROBLEM FOCUSED EDUCATION
A REPORT TO THE PRESIDENT'S ENVIRONMENTAL QUALITY COUNCIL BY JOHN S. STEINHART AND STACIE CHERNIACK, OFFICE OF SCIENCE AND TECHNOLOGY, EXECUTIVE OFFICE OF THE PRESIDENT, SEPTEMBER 1969

. . .

HIGHLIGHTS AND RECOMMENDATIONS

Concern for the serious and complex problems of environmental degradation is constantly growing. All elements of our society share these apprehensions about the future. At the same time our national wealth, resources, and technological abilities should permit the nation to choose from an incredible variety of future options for the quality of our environment and the kind of life we live in it.

The colleges and universities of the nation constitute a powerful institutional resource for education, research, and open discussion of our problems and opportunities. At present, except for the prophets of environmental disaster, little of this open discussion of our future environmental alternatives seems to take place at the colleges and universities. There is a national shortage of broadly trained professionals to deal with environmental problems. This report is a study of a few of the vigorous multidisciplinary programs at universities. The aim was to discover what kinds of programs have been tried, which ones have been sucessful, and how the federal government might encourage the promising efforts.

Extensive discussions were held with faculty, students, administrators and interested people from outside universities about multidisciplinary environmental programs. Detailed on-site studies were made of six programs. We found that there do exist some very exciting and promising programs. Many of these programs face opposition within the university and all lack a suitable funding mechanism. We conclude that *two features are essential for such problem focused programs to be successful* (although they alone cannot guarantee success):

1. *Substantial or complete control of the faculty reward structure* and
2. *Freedom to be innovative in introducing course material, educational programs, work study programs, and curriculum requirements for degrees.*

We found the student participants in these programs to be enthusiastic and absorbed in their work. An unexpected finding was that more than half the students in such problem focused programs have held jobs for some years and have returned to the university to seek out these multidisciplinary programs because their earlier university education did not satisfy their requirements. It is our feeling that problem focused programs of the sort we examined provide the opportunity many students seek for an education relevant to society's problems, yet thoroughly professional.

We found that federal funds being expended at universities for environmental problems do not encourage problem focused multidisciplinary education and may even discourage the establishment of such programs. The appendix reviews the history of federal funding of interdisciplinary programs and we have concluded that new directions are required.

We have therefore recommended that the Federal Government assist in the formation at colleges and universities of Schools of the Human Environment answering the above criteria. Their common purpose should be problem focused education and research directed toward people's need and desire for satisfying life in pleasant surroundings. The historical examples of schools of agriculture and schools of public health illustrate that such efforts are far from unprecedented. Initially such a program would cost approximately twenty million dollars, some of which could be transferred from existing programs. We recommend further that initial funding be done by an ad hoc group drawn from the interested mission agencies and the National Science Foundation and operated under the policy guidance of the President's Environmental Quality Council. . . .

[*Excerpts from the remainder of the report may be found in Appendix C.*]

The Necessity for Restructuring Colleges and Universities

Mr. Brademas. I take it the fundamental thrust of your report was, indeed, in effect to restructure at colleges and universities some of the efforts in the whole field of what

might be called "environmental education," in order to establish a multidisciplinary approach.

Would it not be possible, with existing programs, to embark upon such a reshaping? That is to say, it would not be necessary, would it, for the federal government to provide additional funds for multidisciplinary approaches to environmental education to be undertaken?

Dr. Steinhart. It would be possible if the rules of the current grant lines were changed. So long as they are funneled into the narrow disciplinary departments, I submit you will get nothing but more of the same, and you will get little in terms of multidisciplinary education.

Mr. Brademas. That is a scathing indictment of the university faculties and administrations of this country.

. . . What I am talking about now, as I am sure you are aware, does not directly deal with the nature of the bill before us. But, if I understand you correctly, Dr. Steinhart, you are saying that unless, with respect to federal funds, the rules of the game are changed, there will be no significant move in the direction of multidisciplinary approaches in American higher education.

Dr. Steinhart. I think that is correct. I think the important point to emphasize is to try, difficult though it may be in these days, for all of us to put ourselves in the position of the student. It is all very well to have monitoring programs and research programs which may, added together, be somehow vaguely interdisciplinary. From the point of view of the students confronted with a choice of getting a degree in biochemistry or plant physiology—and there is nothing in between—there is nothing to identify with that has the breadth of vision that they feel they need.

If I find a school that offers real breadth of vision, I am going to gather up some of my students from the East Village and the Berkeley slums and bring them back to try all over again.

Mr. Brademas. There are implications to what you said. One suggestion is that if we are going to make serious headway in the direction of the recommendations in your report, we are going to have to reshape the authorization legislation in the field of higher education to a considerable degree.

Capabilities of Universities to Lead in Pre-college Educational Change

Another is that it is not a particularly hopeful harbinger for the kind of leadership that we might expect out of higher education in the United States in the ecological field for elementary and secondary education at the community level.

That is to say, where are the elementary and secondary schools, to encourage environmental education—which is the principal purpose of the bill before us—going to turn for intelligent teacher training, or intelligent curriculum development, or intelligent project demonstrations, if all of the university people are living in their narrow little cubicles?

Dr. Steinhart. I don't mean to paint the picture entirely black. In terms of individual people, I would say a very large number of individual teachers at the universities are prepared to do all kinds of things. A very distinguished physician walked out of his cancer research lab and joined one of the problem-oriented programs. Such things are not uncommon.

It is the institutional purposes of the expert technocratic educational idea that we have fostered for a great many years which are at odds with the kinds of approaches I think you are seeking in this bill and which I would certainly like to see.

Mr. Brademas. It may well be, then, that we should change the language which I believe the bill now contains, which in effect suggests that most of the curriculum development would be done by colleges and universities, to be sure that that language is flexible enough that we are not hung up on higher education in this country, depending solely on them to be helpful to us in producing the kind of program we need at the elementary and secondary level and for community conferences.

Dr. Steinhart. Provided there is flexibility. I think in my statement I was trying to make clear there are a sufficient number of people prepared to do the right thing and prepared to do, I think, some experimentation—since we don't know all of the answers on how to do these things—provided the legislation and the implementation is flexible enough to permit it.

In our new Institute for Environmental Studies at the University of Wisconsin we will have this summer a group of ten students and a young faculty member designing the new curriculum for this program. That seems to me to be the kind of approach that one would like to take.

Mr. Brademas. Are there many universities in the country where there have been established relationships between those concerned at the university, that is to say, the scholars at the university, with the local school system with the environmental studies field?

Dr. Steinhart. Of the ones we looked at last year, I would say there are half a dozen or so with well developed relationships of this kind, and perhaps another 20 or 30 that are moving in this direction in ways that I certainly would think were quite helpful, although it was a little new to report any great successes.

Of course, one of the greatest difficulties on the university campus on this score is the school of education. And if you take the somewhat cynical and kind of cute comments I made about the rest of the university faculties and multiply them by a large number, you have the school of education.

Inadequacy of the Term "Environmental Education"

Mr. Brademas. Can I ask you why you said you were uncomfortable with the term "environmental education"? We did not use the term "conservation education," but thought "environmental education" would be broader. Do you have a better phrase?

Dr. Steinhart. I suppose it is because I always root for small guys and losing teams. Therefore, the current fashion always makes me somewhat uneasy. I think it is all right. I think the point being made by Dr. Mead several times in this morning's discussion is that somehow there ought to be an inverse-square law relating to people. We not only suffer from most of the troubles, but we made

most of them.

If this bill is for a program in scientific ecology, I would find myself in considerable disagreement with Dr. Libby, who seems to be directing environment to some other kind of technocratic expert to tell those people what they should do. This is a human problem.

Mr. Brademas. What you are talking about is having an accurate definition of the phrase "environmental." That is to say, we need to be sure that the phrase "environmental," or that word, embraces the adjective "human."

Dr. Steinhart. I think that is very close to it. What we found disturbing last year, and have been having difficulties with in the program I am trying to join with, is how to bring humanists themselves in the educational system into this collection of questions about the human environment. They seem somewhat uneasy, and no one is sure how to do it.

Mr. Brademas. We invited a theologian and an artist as the lead witnesses on this legislation because we were anxious to establish at the outset the kind of concern that I think is representative of what you have said, and also, I take it, the reason that you in your report recommended the establishment not of schools of environment but schools of the human environment.

Dr. Steinhart. That is exactly right. Your committee exhibits more of the understanding of the problems in this case than many the senior faculties of the university, who look for a collection of specialists to add together.

Mr. Brademas. We are politicians.

Dr. Steinhart. I am beginning to think that is a better preparation for understanding people than academic preparation in many ways.

Changing Values

Mr. Brademas. I have one more question. What do you have to say with respect to the attitudes, values, life styles, if you will?

Dr. Steinhart. It happens this semester I am living in the midst of the student radicals, revolutionaries, or what have you, at the University of Wisconsin. It is an interesting experience. What I think we must begin doing at some time in the near future is to begin to encourage people to experiment with how they live and inquire seriously how these experiments come out. I am talking about communities, towns, cooperative arrangements of various sorts.

Much of the experimentation is going on among the young, and it is undeniably aimless, frequently destructive, and certainly is not a long-term solution. Yet, at the moment, it is quite unpopular to express the idea that you might permit people to experiment with how they live, or in fact encourage them to experiment with how they live.

We, instead, tend to experiment on people. After all, any new government policy is an experiment on people. We don't call it that, but that is what it is. It seems time to permit some experiments with people than can be turned off after you find out how they work, particularly if they don't work well. I hope there are members of the population over 25 who will become involved in some of these experiments. Some of them are going to be around a long time yet.

Failing that kind of experimentation and discussion of it and analysis of it, I really don't see how we can expect anything other than the same kind of aimless, frequently destructive dropout kind of experimentation we see going on at the present.

Mr. Brademas. This has been very helpful, Dr. Steinhart. I think you have alerted our attention to one of the very serious problems in making an advance in this field, namely, the narrow rigidification that prevails in university faculties. And though this bill is not fundamentally a higher education bill, I think the problem you discussed is one we must have in the forefront of our own thinking if we are going to be able to encourage effective environmental education at the elementary and secondary school level.

Dr. Steinhart. I think the universities have, and in certain specialized circumstances, can, provide feedback into the secondary schools, and the community at the adult-education level. It is the focus on professional education—as little teaching as possible, as many papers as possible—that places serious opposition to much more free-flowing higher education programs in which the feedback to the high schools and to the community is not only encouraged but is just the accepted way of doing things. . . .

Mr. Brademas. Thank you. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman. Thank you, Dr. Steinhart, for a very helpful statement.

To pursue the point you were just talking about: I sense that in this growing interest, particularly among the young people, in the environment there is a tendency to classify people and some institutions as polluters and others as nonpolluters.

Also, it would seem to me that in an educational process a good beginning point is an acknowledgement that there are no nonpolluters among us, and that we all contribute to the problem and have an obligation to help find the solutions. Would you concur with that?

Dr. Steinhart. Oh, absolutely. One of the reasons I find it difficult to endorse only the need for technical specialists as a solution to the problem is that the solution to the pollution problem is clear. You have only two options. You either spread it around thinly, or you eat it. That is all there is. The rest is engineering.

In a somewhat larger sense, it is the devotion to unbridled growth. When unbridled growth occurs in the human body, doctors call it "cancer." Unless one begins to try to curb this, I don't see much of anything that can seriously be done.

I think that focus, which frequently does occur, as you suggest, that there is somewhere a guy in a black hat saying, "Let's give them another dose of smoke today," is not very useful.

Mr. Hansen. I appreciate your concept, also, that it is really far more basic, and what we are looking at ultimately is a change in the system of values. Maybe instead of using a dollar sign as the measure of so many values in our society, the purity of the air or the water or the scenic beauty of the countryside will be placed higher on the

scale of values.

Dr. Steinhart. It seems to me that human dignity and satisfactions encountered in their lives are the scale of values we would like to have. I am not sure it would be something that would be measurable, or that we should measure it if we could. But I do think that somehow we have to change present values.

The national budget reflects our national priorities. And I assume it represents something about our values in the nation. I find that disturbing.

. . .

Mr. Hansen. Thank you, Dr. Steinhart.

Mr. Brademas. Dr. Steinhart, your testimony has been most helpful. I know in discussing environmental education in talks and so, here and there I draw heavily on the report that you and your associate—who I understand is now an undergraduate at the University of California at Berkeley—Stacie Cherniack, put together, because it seems to me to represent the most thoughtful survey I have seen on the role of colleges and universities in the whole field of higher education. I hope that we will take to heart what you have been admonishing us to do.

Thank you very much indeed.

We are adjourned for this morning.

(Whereupon, at 11:40 a.m. the subcommittee recessed, to reconvene at 9:30 a.m. on Thursday, April 9, 1970.)

DAY 6

House of Representatives, Select Subcommittee on Education
Washington, D.C.

April 9, 1970

An ecologist and several representatives of private organizations involved in environmental and conservation education testified on the sixth day of the hearings. Both John Cantlon, an ecologist and provost of Michigan State University, and Mrs. Donald Clusen, chairman of the Environmental Committee of the League of Women Voters, stressed the need for educating the general citizenry about environmental problems and choices.

Cantlon pointed out that much of the existing school curriculum is based on the assumption that there are certain areas of knowledge in which all citizens must be competent in order to fulfill their vital decision-making roles in a democratic society. Thus, we have required courses such as civics and American history. Cantlon maintained that knowledge of human and natural ecosystems is also necessary for effective citizen participation in democratic decision-making.

Cantlon noted that inserting environmental studies in an already crowded and somewhat rigid curriculum is easier said than done and suggested modification of existing courses to accommodate ecological knowledge and approaches. He specifically cited the home economics course as one appropriate starting point. This segment of the curriculum might easily be adapted to studying the home as an input-output system within the larger environment.

Mrs. Clusen also emphasized the importance of an informed citizenry in the democratic system and described some of the efforts of the League of Women Voters in the area of environmental education for voters. She noted that the bill might well pay more heed to the area of adult, nonschool education. There is a great need for voter education at the local level—where the specific choices are made. Voters must have information applicable to their own locality, not just a general understanding of environmental issues.

Representatives from several private conservation education groups also testified, presenting additional ideas on the roles such private groups could play in environmental education.

The subcommittee met at 9:45 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Landgrebe.

Staff members present: Jack G. Duncan, counsel; Toni Immerman, clerk; Arlene Horowitz, staff assistant; Ronald L. Katz, assistant staff director; Maureen Orth, consultant; Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act and related bills.

. . .

Introduction of Dr. John Cantlon, Ecologist, Provost of Michigan State University

Our first witness today is Dr. John Cantlon, ecologist and the provost of Michigan State University.

We are pleased to have you with us this morning. Please go right ahead.

Dr. Cantlon. Thank you, Mr. Chairman, and members of the committee. I would like very much to speak in favor of House bill 14753. In my view, we now need a major effort in improving the educational resources, the techniques and so on, in both public schools and in the mass media, for enhancing the understanding of our present and future citizens concerning the ecosystems that sustain them.

Long ago, in this country, we made the very logical decision to have publicly supported schools to impart to the future citizens of the country the minimal skills of reading, writing and arithmetic. Almost as early, we insisted that these students be exposed to a certain minimal level of mastery of the concepts and the knowledge about certain subject-matter areas.

For example, we insisted that each student be exposed to the essentials of how his government works. These courses are called American government, or civics, or political science, and they are required subject matter in each of the 50 states.

In addition, each state requires that American history be taught in order that each student can appreciate the sacrifices that are required to sustain the social machine that is our government, and although recently our black citizens have pointed to some of the inadequacies and omissions in American history as it is taught in our public schools, no one has seriously proposed that American history be deleted from the public school system.

Citizens obviously do need to know how their government works, how it got that way, and what sacrifices are necessary to sustain it.

Another major requirement that is widespread in public school curriculums is how an individual's own body works, the basic physiology, the basic structure, the nature of the human body. This learning operation is couched in different kinds of packages. It may be in the general sciences course that all students take in junior high, or in the high school biology course, or in a hygiene course, or in the physical education part of the curriculum. Wherever located in the curriculum, throughout the country we require this minimal knowledge for an adequately educated citizen and human being.

Other knowledge required is a rudimentary understanding of international affairs, a rudimentary understanding of our cultural history, a bit of general science which is generally limited to disciplinary looks at physics and chemistry, and . . . an elementary course in the social sciences.

A Conspicuous Deficiency of the Curriculum

How strange it is, then, that we do not insist that each citizen have some rudimentary knowledge about the ecological systems that sustain us. Some knowledge is necessary as to how the life support system of the planet works and what keeps the biosphere healthy—also, as to how our food production systems work, and how the air purification systems work. This deficiency represents, in my own view, a massive flaw in public education, and one so massive and so conspicuous that it is rather difficult in 1970 to understand how we got into this state.

If one harkens back to the nature of the population at the time our public school curriculums were being stabilized, we see that most of the citizens were rural in their origins. Furthermore, the rates at which the human population and technology were then expanding did not appear so awesome. We still had a great deal of the biosphere largely intact. In those times it was reasonable to assume that the average student knew a great deal about food production and the natural state of the biosphere. In other words, the common knowledge students had as they entered or acquired outside school was assumed to be adequate for this facet of the education of our citizens.

Today, one cannot listen to the public media without being confronted with the idea that the earth's life support systems can be placed in jeopardy. Surely we need citizens who are better informed about the nature of the human and natural ecosystems, and most specifically on the fragile nature of these systems. They need to be apprised of the very difficult choices that we will be forced to make, as citizens in a democracy, in the years ahead to make certain that our technology does not irrevocably stress certain of the life-sustaining characteristics of the biosphere.

It is quite obvious that these decisions must stem from knowledge, not from ignorance, superstition or propaganda.

Now, there is much concern today amongst specialists in the environmental sciences and a rather general feeling in the public at large that the current fad concerning the environment will pass, and that just as our concern about soil conservation in the 1930s came, blossomed, and disappeared, and Smoky the Bear became a household friend but has subsequently also essentially disappeared, that this, too, will pass away.

I would like to suggest that concern for the environment will never decline to its former state of low public concern. This is my judgment because for the first time man really is beginning to suspect that he is totally dependent upon the continued good health of the biosphere.

Technology and Insularization in the Biosphere

This biosphere is an exceedingly complex system that contains literally millions of different species of organisms, many of which are not yet known, practically none of which are understood in their physiological or ecological relationships, and the interactions amongst the organisms in these systems is largely unknown.

Yet, these systems, which are essentially unknown, which are made up of many organisms which have high sensitivities to modern technology, are in fact rapidly shrinking in their total acreage as man's impact on the landscape and seascape increases at an accelerating rate.

In other words, the life-sustaining qualities of the biosphere are in some significant ways dependent on less in-

tensively managed land and sea areas. These aspects of our environmental sustaining machine are being reduced to smaller and smaller blocks, that is, a real process of insularization is underway, and at an accelerating rate.

This, in itself, would be worrisome because the systems that are replacing this old time-tested, life-sustaining system are being designed for far narrower objectives, for example, to produce food, to produce places where aircraft can land, to produce harbors, to produce—you can name the thousands of different very specific man-made ecosystems. And the life-sustaining characteristics of the system which is being displaced are not being built into the systems which displace them. This is an extremely important process that is underway.

So, the insularization is going on. The life-sustaining processes of these systems are being left to smaller and smaller areas. Simultaneously, man is also releasing into the biosphere a half million different compounds each year, many of which had no prior existence on this planet, DDT being an interesting example. Organisms have had no prior opportunity to develop resistances to these stresses.

Now, if we have significant parts of our life-sustaining processes restricted to shrinking islands which are also being subjected to widely diffusing, highly stable, very long-lived compounds which stress their species, this is potentially serious. The case of the persistent chlorinated hydrocarbons pesticides was such a case, and there are many other types of compounds which can stress the remaining islands. In other words, significant parts of the life-sustaining qualities of the globe are being reduced to islands, and simultaneously we are oblivious to the necessity that these be preserved in good health. We release wide-ranging poisons which stress these remaining islands. One could scarcely design a strategy of biosphere management that is less responsible, less permeated with the essential sense of stewardship.

It is an idiotic course that we are on. . . . The biosphere is fragile, we do not know how it operates, and we are in the process of expanding human technology and population, insularizing the original biosphere into ever smaller pieces, and these in turn are being subjected to stresses of unmonitored scope.

We have not yet approached the brink, and it would be misleading for me to say that disaster is at hand. In my own view, it certainly is not. However, if one projects the present rate of technology expansion for very many successive years, we will surely have approached the brink. . . .

A Starting Point: The Home as an Input-Output System

It would be presumptuous of me to pretend that I have anything remotely resembling an adequate understanding of actual curricular changes that are necessary. However, a number of years ago as the public affairs committee of the Ecological Society of America was looking at places where one might attack these educational needs, we were made aware of how difficult it is to make change in any public education system. The inertia is enormous. Public school systems have a vast number of teachers who are comfortable in their present curriculums; they don't want to see their courses displaced, and one cannot possibly add an additional course to the curriculum. In other words, for whatever is added, something must be taken out. Obviously, what we are going to need is change in existing courses, at least in the beginning.

Now, as this committee searched around for some place where this totality of man's relationships to his ecosystems could be incorporated into existing courses, one of the areas that occurred to Dr. Bormann at Yale was the public school home economics curriculum. Here, after all, was a body of knowledge, a teaching of concepts that went right to the heart of the matter, or at least could if it were redesigned in the correct way. The home economics course could teach the concepts of the home as an input-output system. Thereby each individual student could relate quantitatively and processwise to his environment in a very personal way. He could be made aware of where his foods come from, what types of agricultural lands are necessary to produce them, and why a citizen of Michigan is dependent on the citizens and the good health of south Florida ecosystems for his fresh vegetables, how he is coupled to watersheds, river and lake systems, airsheds and distant pest-producing areas. National issues often require local individuals to be able to relate to distant situations.

Furthermore, I would suggest that any revision of the curriculum must be couched so that the student in the core city, the suburbs and on the farms all relate to it. If any of these groups fail to see their relationships to the total system it is doomed to failure. We are largely an urban population. We cannot talk about pristine mountain lakes or of the sea without relating them in a very real way to the individual in the ghetto, the suburb or the farm.

Somewhere this new curriculum content has to begin with the home as an input-output system, so that watersheds, food production areas, atmosphere purification processes, and waste disposal systems can be related to each individual. He is in fact coupled to his universe, and he needs to learn that he is coupled to undisturbed portions of the biosphere which process his oxygen supply and keep the nitrogen and phosphorous cycles functioning.

I have gone on far too long here, and I apologize. . . .

Research Techniques for Studying Ecosystems

Mr. Brademas. Yesterday, we were talking to Dr. Margaret Mead about her suggestion that we needed, for purposes of educating people in the whole environmental field, to establish models. She suggested, for instance, the use of islands; but we asked her to comment, and I would invite you to comment, on the possibility of utilizing the computers to simulate a wide variety of variables and thereby enable us to know rather rapidly what the impact of diverse interventions in the ecosystems would be on population, employment—well, one can rattle off a whole litany of events.

Dr. Cantlon. Yes. I think two points need to be made here. Computer simulation is only as good as the infor-

mation you put in the computer. We are dealing with systems that have so many components there is now no computer built, indeed no lash-up of existing computers, that would have the capacity to handle even a modest size ecosystem in its totality.

In other words, we are dealing with numbers of variables here of a very, very large size. We have not yet tackled a problem of this scope by simulation. . . . [W]hat we do is to pick out some subset of a system and test it. We can do that.

Margaret Mead's suggestion that we use islands and simply stress the island and study the behavior of the total island as a unit has virtue; it is a real system. It has all of the components, and while we . . . have neither the man-hours nor the expertise to monitor every species population present, we can begin looking at the health of that system as a totality. The insular example represents a good empirical experimental approach.

I suspect that the research techniques we will be evolving will be many. Of these, the current U.S. portion of the International Biological Program dealing with biomes, such as the grasslands studies in Colorado, represents one major effort at looking at full-scale examples of large systems. Some of the IBP biome study units are relatively pristine and untouched, some involve a great deal of man's influence in them, as for instance the grasslands beef production studies.

These are research approaches, but it seems to me for educational purposes, especially for public school and mass media purposes, these research studies will remain rather esoteric things, essential for acquiring new knowledge; but for effective education we need a way for each individual to visualize himself in one of these complex systems. So, this idea of trying either, through simulation or through describing existing situations, to describe the individual's home as an input-output system coupled to diverse other systems would be one of the ways that I think might be more effective.

Mr. Brademas. Thank you. Mr. Landgrebe?

Mr. Landgrebe. I have appreciated your statement, and I feel that I have gotten some very good thinking and some good ideas from it. I am not sure that I have any real worthwhile questions.

You talk about a fad, and there is a lot of discussion at the present time. Have we not, as these technological acts come upon us, haven't we had a lot of study and work done, sewage treatment plants and so forth? There has been a lot of thought and a lot of money spent in the past on this, has there not?

Fractionalized Approaches to Environmental Problems

Dr. Cantlon. Yes, that is correct. The way in which we have approached our environmental problems, though, has been a highly unitized approach. Currently we worry about phosphorous in the secondary effluent coming from our disposal plants. Earlier on, we didn't even have a secondary treatment process and we worried about the biological oxygen demand of primary effluents. The effluent leaving a secondary treatment plant still contains the phosphorous and the nitrogen and the potassium which now results in the rapid growth of algae in our lakes and streams. These are the same elements we buy to fertilize crop land. The point is that we have in most of our approaches taken a very unitized approach, solving one problem at a time, often thereby displacing it [by] a different problem, occasionally some distance away.

Let me suggest that much larger problem arrays are going ultimately to provide more powerful approaches to the problems. Let's look, for instance, at what seems to be an unrelated pair of pollution problems.

Heat pollution from power generation is currently producing a lot of concern for aquatic biologists and conservationists. What do we do to dissipate this gigantic amount of heat, really a low-grade energy, that results when we cool reactors? The usual cooling technique is a water system, and the discharged warm water creates problems for temperature-sensitive fish and other organisms.

The engineers have been drawn in locating and siting power generators—whether atomic reactors or the fossil fuel type—to places where there is abundantly cold, pure water. Pure water reduces maintenance in the pipes and jackets of the cooling system.

Now, if you think about sites with cold, pure water, they turn out to be trout and other game fishing waters in most of the northern climate. There is no quicker way to have the power generating industry run head-on into both the fishermen and the conservationists. It would make a lot more sense in cooling generators to look for waters of lowest public concern. Now, you can't get any lower in public concern for water than the discharge of a city's secondary effluent. There ought to be a lot more research in how to use this dirty water in generator cooling, and in the process use the low-grade energy to assist in cleaning up the water. The cooling contribution can be an economic incentive to clean up the water.

What I am saying is that our approaches have been so fractionalized that we often don't really solve problems. We displace them—occasionally creating worse ones.

Personal Ethics and "Housekeeping"

Mr. Landgrebe. I certainly can't argue with that. . . .

This matter of pollution—you talk about making this part of the home ec course. In my school days, we considered this to be a part of the health classes. Do you have some suggestion of how we can approach and get the cooperation of folks of all ages in becoming better housekeepers and being responsible?

In other words, we see just as an example, people who empty their ashtrays on the lot at the drive-in family stand and things of this kind. How in the world will we ever approach these matters with individual responsibility, a term that you used yourself?

Dr. Cantlon. In the first place, like any kind of ethical or moral question we do a very poor job of this in public schools. Morals, I think, really have to begin in the home. I would say the first side of responsibility will have to be with parents, and there is every evidence that we have been pretty lax in this. This is not to say that we can't build a better ethical phrasing of men's stewardship and

responsibility for the atmosphere in the way we present materials in public school curriculum. We have tended to err on the conservative side; we have been to loath to intrude the ideas of ethics and morality in our consideration of science and technology generally.

Mr. Landgrebe. I am happy to hear you make that statement, and I hope it will go into the record underscored, because I have had one particular contact with a situation where people who actually had garbage service at their door in town would take their garbage out and scatter it along a country lane.

I think that ends my questions. Thank you.

Mr. Brademas. Thank you, Dr. Cantlon, for being with us today. . . .

Introduction of Mrs. Donald Clusen, Chairman, Environmental Committee, League of Women Voters

Mr. Brademas. We have five more witnesses this morning, and the Chair would like to suggest that they come forward and, to the extent possible, summarize their statements. . . . We want to put questions to you, and I think we might do it by inviting everyone remaining to come forward and we shall hear you as a panel, as it were, and we would like to hear first from Mrs. Donald Clusen, chairman of the water resources committee of the League of Women Voters. Then we will hear from Dr. Stahr, and Mr. Dustin, and Mr. Clapper, and Dr. Smith, in that order, if that is agreeable. Gentlemen, won't you come forward and join Mrs. Clusen.

Mrs. Clusen, we are pleased to have you here. Why don't you go ahead.

Mrs. Clusen. The League of Women Voters of the United States was glad to receive this invitation to comment on the Environmental Quality Education Act. I really am not ready to comment on matters of school curriculum, but I do appreciate the opportunity to tell you what the League thinks about the need for more and better education of both adults and children on environmental problems, and it is to this point that I would like to address my comments today.

The League of Women Voters has had some firsthand experience in attempting to create public awareness of environmental problems. We have long recognized the urgent need for more attention to policies, programs, and funds that would serve as incentives to both layman and educator in building increased understanding and awareness of environmental problems. . . .

In spite of the current rhetoric, a large segment of the public still does not fully understand the dimensions and urgency of our environmental crisis and the threat it represents to the quality of human life. What is even more alarming is that among those who do recognize the problem, there seems to be a growing feeling of frustration and helplessness about whether current downward trends can be reversed.

League members have a great deal of faith in educational processes, generally. We believe most national problems are aided by intensive public information efforts. Indeed, this is the basis of our existence as an organization. We are fond of saying, "Let the people know, make the people care, help the people act," and it seems to us that the Environmental Quality Education Act attempts to do just this—to arouse both students and their elders to an understanding of the physical world in which they live. . . .

The Need for Adult Education on Environmental Problems

Section 3, subsections (3) and (4) of the proposed Environmental Quality Education Act are of special interest to the League of Women Voters in their designation of possible grant recipients as "other public and private nonprofit organizations," to provide "workshops, institutes, seminars and conferences" for "community education on environmental quality and ecology, especially for adults."

Since 1964, the League and its education fund have been engaged in citizen education seminars on land and water use under funding from a federal agency. During a five-year period, conducting three seminars each year, League members have visibly demonstrated in every region of the country the means and value of confronting citizens with basic information on water quality problems and the alternatives for solving them. . . .

In the 14 years that the League of Women Voters has been working on water resources in some 1,300 local leagues in this country, in 50 states, Puerto Rico and the Virgin Islands and at the national level, we have learned that people want information about how undesirable conditions can be improved.

It is not enough to tell only how bad conditions are and how much worse they will become. People want to know what improvements are technically possible, what choices they have, and what the alternatives will cost communities and individuals. Adults seek to learn what they can do within the established governmental system to promote working with nature rather than against her.

For adults no less than for children and young people, it is important to "encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance."

Most of the choices for land, air and water use are made at the local and regional level. Therefore, this is the place to imbue people with a desire for constructive change. Voters need information applicable to their own localities, information that makes issues clear in terms of the general values and social objectives of the community and the region.

We in the League have found that people want to put what they learn to work. They want to achieve improvement. Therefore, environmental education for adults must be action-oriented. Yet, adults needs help in where and how to express their views to those who have the power and responsibility for decision-making.

Everywhere there is actual or incipient local leadership for environmental quality, but local leaders may need help in learning where they are, where they want to go, and how to get there. It is important to equip local leaders

with an understanding of interrelationships between air, water, land, sea, plants, and animals and man. It is equally necessary for local leaders to combine concern for cities and for open country.

The Role of Private Citizen Organizations

Helping to develop such leadership is the role I see for citizen organizations in the years ahead. There exist private nonprofit organizations with great ability to help in adult education on environmental matters. These organizations have an entry into the community. Their members are known and trusted. They have the contacts to bring in stimulating people with wider experience and different viewpoints.

Many nonprofit organizations could do more than they are now doing. What private nonprofit citizens' organizations usually lack is the money to enlarge their educational work.

I feel confident from the League's experience that vital public support for wise, long-range environmental management will develop more rapidly if some aid is available through federal grants for citizen organizations to extend somewhat the adult education work they are already doing in this field.

The major problem in environmental education is the problem of reaching all voters, both present and future. We won't be successful in solving our national problems with only part of our population informed. We need a systematic plan to reach all in school, and we need a program of adult education as well.

Educational projects carried on by nonprofit citizens organizations have proved to be important means of adult education and are worthy of support. Therefore, because environmental education can be the catalyst to a citizenry able and willing to meet the threat posed by our ravaged environment, the League of Women Voters of the United States supports the purpose of H.R. 14753 and similar bills.

Mr. Brademas. Thank you very much indeed, Mrs. Clusen. . . .

[*The subcommittee next heard from Dr. Elvis Stahr, president of the National Audubon Society. He described the various educational programs of the Audubon Society, including their nature center program for children and teachers. Following Stahr's testimony, the subcommittee heard short statements by Thomas Dustin, executive secretary of the Indiana Division of the Izaak Walton League; Louis S. Clapper, director of conservation of the National Wildlife Federation; and Dr. Spencer Smith, director of the Citizen Committee on Natural Resources. Then, questions were directed to Mrs. Clusen, Dr. Stahr, Mr. Dustin, Mr. Clapper, and Dr. Smith as a group.*]

Mr. Brademas. I want to express my appreciation and that of the members of the subcommittee to all of you for your testimony today. It has been enormously helpful to us, as I think you can judge from our questions.

(Whereupon at 12:10 p.m., the subcommittee recessed, to reconvene at 9:30 a.m. on Friday, April 10, 1970.)

DAY 7

House of Representatives, Select Subcommittee on Education
Washington, D.C.

April 10, 1970

A conservation educator and a representative of the forest products industry offered their support for the bill during the seventh day of testimony. However, their general agreement about the need for educating the public about environmental problems stemmed from quite different positions.

Martha Henderson, of the Conservation Foundation, presented a broad view of environmental education as the exploration of many alternative ways of living and the preparation of students for life in a continually changing world. Schools should be concerned with changing values—not, as at present, with simply transmitting the values of the status quo. She particularly emphasized the role of the arts and humanities, which are so frequently thought of as mere frills, in helping us to give expression to our changing values—our aspirations, dreams, beliefs, and ethics.

In contrast, Casey Westell, General Woodlands Manager of the Packaging Corporation of America, saw in the bill a vehicle for improving the level of technical and scientific knowledge of the public-at-large. Westell decried the "incredible ignorance and half-knowledge that exists even among our otherwise educated people." He cited several popular myths about environmental problems which he believes have handicapped efforts by companies such as his to apply scientific forest management methods.

Westell's suggestions on the composition of the advisory committee brought to the surface a serious difference of opinion—reflective of a split within the country as a whole—about the proper role of various segments of the political and economic system in solving environmental and other problems. Westell proposed that the membership of the advisory committee be more carefully specified in the bill, in order to assure a "distribution of influence" representative of all concerned segments of the population having relevant technical and scientific inputs. Congressman Brademas sharply questioned Westell's list of groups to be included, pointing to the problems of committee size and especially emphasizing the common public concern that regulatory agencies have been captured by the industries that they are supposed to regulate.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Meeds.

Staff members present: Jack G. Duncan, counsel; Ronold L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Education Act and related bills.

. . .

[*A short statement in support of the bill by the Honorable Nick Galifianakis, congressman from North Carolina, was inserted into the record, though he was unable to attend the hearings in person.*]

Introduction of Martha Henderson, Director of Education, The Conservation Foundation

Mr. Brademas. Our [next] witness is Miss Martha T. Henderson, director of education, the Conservation Foundation. We are pleased to have you with us this morning.

Miss Henderson. Mr. Chairman, thank you for the opportunity to testify at these hearings. Although I am employed as senior associate in education at the Conservation Foundation, the following statement is my own and does not necessarily reflect the views of the Foundation. . . .

A Broader Definition of Environmental Education

A broad definition—broader than the one I think given —of environmental education is a necessity for this bill.

U.S. society has recently tended to offer a declining range of options for the ways in which we should live. The emphasis has been on material progress in setting national and, to some extent, personal goals. We must provide a far greater range of options for future living which allow for a time of greater economic equilibrium. This may involve a different standard of living, new forms of social groupings, smaller families, and a shifting of values to nonmaterial gratifications, all of which hit us at very fundamental levels of assumptions about how life actually is or how it should be. But with population pressures, it may become necessary to develop nonmaterial values strongly, since there may be less opportunity for economic benefits for all.

At the moment, education is primarily transmitting the values of the status quo. While we must maintain the role of schools in the transmission of our cultural and historical traditions, we must change education in order to have school and university experiences help to suit us for a continuously changing world. We cannot know all the outlines of this world, but we must use education to begin to help us shape new ways of life.

Obviously such a concept involves children and college students in active knowledge of the real world. Too often at present our schools are insulated from the life of the community around them. I think we have some sample programs which use the city for learning and we need places for students to learn in other ways.

The changes we are posing are major and they involve using education about man and his environment as a vehicle for school and university reform. This particular bill cannot meet all educational needs, but it should contribute to basic changes in our value system.

Many question whether U.S. society can be moved toward such profound shifts. There is always a great deal of inertia in a social group with any degree of stability, and a lot of people in this country still draw considerable satisfaction from the way things are.

But one can perceive signs of a degree of openness to change in the United States, and it is upon these signs and our belief in them that we must build. We see young people and some not so young experimenting with freer social groupings. We observe those who appear to be troubled by the obvious problems of our world, but unable to figure out options which do not unduly threaten them. Their difficulty arises, in part, because the true shape of various alternatives is not made easily available for consideration, nor are they able to find ways to experiment with new options.

But as a nation we are usually hopeful and want to believe in a bright future somewhere, somehow. We care especially for the future of the young in whom hope for all of us in inevitably vested. If we can give people new ways of life to work toward which seem potentially less problematic and full of despair about our environment and more fulfilling than those they have at present, then we may be able to achieve a situation in which continuing change is acceptable.

To search out how to live in harmony with new ways of life will require the resources of many fields of science, social and behavioral science, and planning. It should also include the insights of the arts and humanities.

The Role of the Arts and Humanities

What is to come is frequently expressed metaphorically by artists; they press their feelings into the future and give them shape. It is through the arts and humanities that we can first give voice to our aspirations and dreams and even to our religious beliefs and ethics. If we can write poems about our hoped-for world, inner and outer, if we can act out theater games or project new architectural forms for our homes and communities, then we can begin to set forth options for our futures. Artists can lend drama and esthetic form to our choices. . . .

Nor are the arts to be considered only a frill. They can be a tremendous source of inspired learning experience. If people are not excited about what they do, they will not learn. We have only to watch the young singing with Pete Seeger or experimenting with a film about their neighborhood to see that they are capable of being "turned on" by them.

Once involved, children can experience the serious, in-depth education we should want for them in all areas of learning. They can explore alternative ways of expressing themselves symbolically and can learn from history and from foreign cultures how others have handled particular problems.

They can, as Kenneth Koch describes in his recent book on teaching poetry at elementary school, begin to comprehend the uses of comparison and of contrast, of metaphor and analogy. They can think or express themselves and they can be active and play. Is it not through such varied explorations that we begin to take pleasure in learning about ideas and expressing them in all their complexities and depths? Is it not in this manner that children learn how to think clearly? Do they now?

In short, I believe the arts have many uses. They can help to counter the present situation where too often citizens passively accept environmental misuse and ugliness, feeling powerless to make judgments on esthetic matters concerning the shape of their lives. Feeling they can do nothing, they sink back into apathy which is potentially disastrous to any encounter with our world.

A degree of competence in writing, film, architecture and other areas will help to communicate with one another about our problems on verbal and nonverbal levels. This ability to communicate can be used to reach wide audi-

ences through TV and other media which can do much to get our environmental messages across.

We lack sufficient educational materials in these fields. The Architectural Forum notes a number of programs in architecture and planning, and the Office of Education, the two National Endowments and private foundations have funded other intriguing work. There are also programs where children actually study in museums or where poets are resident in schools, and artists now work in our national parks. I believe many of these efforts deserve support, but essentially I think we should try to back arts and humanities curriculums only as part of interdisciplinary programs which are aimed at changing basic values.

Differing Approaches to Multidisciplinary Studies

The arts and humanities alone, of course, do not suffice to build a better world. I have emphasized them because they are so often neglected and can be particularly potent vehicles for change. But the poet should know how to engage in effective political action about air pollution, as well as to write of his troubles with breathing. The architect needs training in form, space and color, but also in engineering and economics. There is a basic role in all environmental deliberations for scientific ecology, and I agree with Mr. Aldrich's plea for a greater input of behavioral science. In other words, we are talking about a multidisciplinary approach.

This approach is now exceedingly popular and leads directly to a breaking down of traditional disciplinary barriers in academia. Two excellent statements of this problem are given by Steinhart, with whose report on universities you are familiar, and by Dr. F. Kenneth Hare in the January 23 issue of *Science*. I would underline the need they express for student participation in working out changes in academic structures. And I do think this bill ought to perhaps fund some student programs.

Perhaps interdisciplinary studies should come naturally to us. After all, the small child naturally responds to his world through many senses and activities and can integrate the message he receives. A Washington-based environmental collaborative is studying this area, and some few programs emphasize an open classroom with less disciplinary emphasis.

The bill should help schools with this type of organization. But in our society usually we quickly wean children away from their early integrated approach and guide them into specialization. In time we become fearful of once again being obliged to cope with broad ranges of reality.

To ease this fear, and to make institutional changes, we need to explore methods by which multidisciplinary approaches to environmental problems can be made more manageable and thus less threatening. At the simplest level, a man who is specialized in one subject can make himself sufficiently familiar with others to work with them.

A second and much-vaunted scheme concerns the interdisciplinary team, which seems particularly suited for fieldwork. While not always entirely smooth running, and subject to the usual human failings and the threat of superficiality, teams can certainly be effective. I strongly endorse funding multidisciplinary university programs.

These types of practical endeavors do not remove the compelling need to find overreaching principles which may give us intellectual order. The development of such concepts will depend in part on defining our environmental problems at levels of sufficient depth. If we allow ourselves merely to get caught up in an endless array of pollution problems, we shall easily become scattered. On the other hand, if we can press ourselves to more fundamental global issues such as new sources and uses of energy and new ways of grouping humans to use it, we may begin to arrive at ideas large enough to provide a measure of intellectual security and excitement.

Another source of order in complexity is systems analysis. Clearly the basis of an ecological approach lies in the reality that we all interrelate with one another and with all the living and man-made environment. We must acquaint (or possibly more accurately reacquaint) children with the idea of systems. Much more work is needed on how the young perceive the systematic relationships of their world, indeed how any of us do. Individuals and groups publishing in environment and behavior are exploring this field and deserve assistance.

But once we have identified components of a system and have seen how they relate to one another, then we are faced with understanding their dynamic movement. In problems as complex as our urban environment, . . . the human mind unaided may have almost insurmountable difficulty in comprehending how the system operates and outcomes to be expected over time. A computer can be an invaluable tool.

Nor should the use of computers be feared as destructive to our humanity or of the arts. In fact, artists and scientists are now collaborating on the use of computers to build better environments. The goal for computer use should be what Erich Jantsch refers to as sociotechnological engineering. We do not yet fully understand how to employ computers to solve or assist with massive problems.

But we should open the door to students, to let them carry our explorations forward by introducing most of them to the use of this tool. We need some work on how people do receive systems. Once we understand what the components of the system are and how it fits together, we need to realize how it works dynamically, and there the computer is an invaluable tool.

While I think some people feel that the computer will dehumanize our society, I think it can be used to make us more human. I think possibly a demonstration program especially of school use of these computers in this field might be a worthwhile effort.

The necessary cooperation on complex ecological-social systems implies exploration of cooperative systems of social organization. Most of those now writing about new institutional forms point to groupings with much more participation by the varied members of all levels and less authoritarianism.

Not everyone has the same voice in an organization, but all work together toward a common goal and mutually learn along the route. In such a situation students can have a genuine place in effecting change, while teachers must forswear their omnipotence and become guiding co-learners in the process.

I believe that education badly needs the insights of policy planners in order to gain more clarity into the interplay between values and institutions. I would note policy planners are also very much interested in the dissemination of change throughout a society. . . .

International Aspects of Environmental Education

During Mr. Aldrich's testimony, the chairman inquired about international education. Since, like Mr. Aldrich, I have connections with the International Union for the Conservation of Nature and Natural Resources (IUCN), let me add some footnotes on this subject.

First, I believe that since ecological problems know no boundaries, inevitably we must eventually educate people to view the environment as a global proposition. Margaret Mead has spoken to you eloquently about this subject. . . .

The work of the Conservation Foundation on the ecological aspects of international development and of David Burleson and others in population education is relevant. There is an area where we should train those in international aid programs about ecology. The way to do this is to get a lot more about ecology into our international studies programs, which are at the moment very much oriented toward social studies.

Second, if we are considering exploring new life styles, we should by film or travel try to present the modes of life of many cultures in varied environments, simple and complex. They can be used for comparison, as sources of ideas which might be pertinent even in our different setting, and to give us a sense of our ecological position relative to the rest of the world, and they can give us a sense of our place in the world.

There are some interesting programs there. We have provocative programs in anthropology mainly at college level, and there are also the Education Development Center's *Man: A Course of Study* and the Boston Children's Museum MATCH Box on Japanese life as examples.

Third, there are a number of programs going on abroad which deserve consideration. I don't think any of them are as extensive in scope as this bill. Those in the developing countries obviously have other emphases and less emphasis on the individual because of their strong national priorities. Those from Europe or Japan reflect a strong disciplinary bias, usually in biology or outdoor education. But England, in particular, has developed some of the most extensive educational reforms at primary level yet known. Their influence is already considerable in the United States and is relevant to nondisciplinary classroom organization.

In order to keep in touch with developments, I would suggest that the appropriate U.S. body arrange liaison with the IUCN Education Commission in Morges, Switzerland, since the Union has much information in this area and will soon be expanding. Mr. Aldrich and I are a possible additional source of assistance through our connection with this IUCN Commission's North American Committee. Ties should also be maintained with the various United Nations agencies, both for data and in order to arrange participation in a number of upcoming major environmental congresses.

Thank you for your attention.

Mr. Brademas. Thank you very much, Miss Henderson, for a most comprehensive statement.

[*Miss Henderson answered questions from Congressman Brademas and offered an explanatory document, "Programme for 1970-72 of the IUCN" to be inserted in the record.*]

Introduction of Dr. Casey E. Westell, Jr., General Woodlands Manager, Packaging Corporation of America

Mr. Brademas. Our final witness this morning is Dr. Casey E. Westell, Jr. I am very pleased to call on a distinguished member of this subcommittee, Mr. Meeds, to presnt Dr. Westell.

Mr. Meeds. Mr. Chairman, I present Dr. Westell not from personal knowledge, but from recomendations of some very close personal friends who have recommended him highly, and having looked over his background, I can see why.

Dr. Westell this morning testifies on behalf of the American Forest Products Industries. These are industries which manufacture lumber, plywood, pulp, paper, and utilize a good share of the wood products and wood in the United States, both soft- and hardwood, and I think probably a group which has as great a stake in the challenge of environment as any other group.

Dr. Westell comes to the committee this morning with a great deal of experience in this field. Dr. Westell, we are very happy to welcome you here.

Dr. Westell. Thank you.

Mr. Chairman and members of the subcommittee, with me is Mr. Ralph D. Hodges, Jr., vice president and general manager of the National Forest Products Association.

It is a distinct pleasure to be with you today to testify on H.R. 14753, the Environmental Quality Education Act. In the time allotted to me I will summarize the full statement I have prepared for insertion in the hearing record.

My name is Casey E. Westell, Jr. My occupation is general woodlands manager for Packaging Corporation of America, and my headquarters is in Filer City, Michigan. Professionally, I am an ecologist.

I am appearing on behalf of the Forest Industries Council which is a policy-coordinating organization on resource matters for the American Forest Institute, the American Paper Institute, the American Plywood Association, the American Pulpwood Association, and the National Forest Products Association. Together these organizations represent every facet of industrial forest management and forest manufacture in this country. . . .

My testimony embraces three major points:

The Need for Ecological Understanding

First, a challenge that the integrity of ecology as a science be maintained in programs, curricula and information emanating from this legislation. Our industry sees important benefits to be derived from a universal infusion of our citizens with the environmental facts of life. Education is needed to dispel the incredible ignorance and half-knowledge that exists even among our otherwise educated people.

It is vital, if we are to extricate ourselves from the many serious environmental and pollution problems that beset us. It is necessary, if our legislators are to have sufficient understanding to enact laws that will enable man to protect himself from himself. It is essential, if man is to improve his relationship with his environment in an orderly and rational manner rather than destructively as the result of the amateurish and emotional machinations of perhaps well-meaning but environmentally illiterate people.

Yet, all of our environmental efforts—whether they are within the scope of this legislation or otherwise—must be based on a solid foundation of the available technical and scientific knowledge. With this knowledge, we believe, an informed public will give its support and approval to solutions to our national problems of pollution and to the wise use of our natural resources.

In my own case, as an industrial forest manager responsible for over 210,000 acres of timberland that support thousands of jobs in processing and for manufacture, it is essential that I be among those most sensitive to changes in the environment. The nation's foresters and other personnel—many of whom are professionally trained experts in ecology—are the stewards of the millions of acres of industrial and government forests. One-third of our nation is forested.

The "Paul Bunyan Syndrome" of irresponsible loggers and exploited forests is a part of history repugnant to our ideals and contradictory to our profession and contemporary practices. The art of silviculture (producing and caring for a forest) today has infinitely more basis in scientific method and technology—and its practitioners have more professionalism than ever before.

Yet the application of new scientific methods of forest management in this country, we believe, has been handicapped because of lack of understanding and knowledge on the part of many of our citizens.

For example, my statement refers to a number of widely believed myths and misconceptions on just the limited subject of redwood trees. The task of our industry functioning in the midst of environmental illiteracy can be extremely difficult, and on occasion, impossible. Some of us believe that in our present society and educational system, our youngsters know all about sex before they get to the birds and bees, and too many never do get to the flowers and trees.

Educational Programs of the Forest Products Industry

The second part of my testimony deals with a number of educational projects and activities initiated and administered over the past 25 years by forest products companies and associations. Programs are continuing in conjunction with local schools, school districts, state education systems, colleges, universities, local units of government, conservation groups and women's organizations.

I call your attention to them for they are quite wide ranging. They include field study trips; various types of tours of private industrial forests, plant operations and logging camps; teacher training centers, workshops and seminars; and multitudes of printed, audio, and visual educational materials and teaching aids.

For obvious reasons, most of these educational activities have taken place in forested areas of the country. This is changing, and a beginning has been made in introducing some of these activities to urban areas. I feel very strongly about the importance of ecology in the urban areas, and the demonstration forest idea is one such project which could be transplanted anywhere in the country where there are existing tree farms. A few acres of timberland or even a large available field where a miniature forest could be developed would help, provided suitable sponsors and technological assistance were readily available.

Ideally, a demonstration forest could provide extensive educational experiences for all age groups, including demonstrations of proper silviculture practices from the germination of the seeds to final harvest. For example, it would be possible to show how thinning improves a timber stand; how trees are identified; how insects and diseases affect trees; the ecological life of a forest that might include its function as a watershed, a habitat for wildlife, its relationship with a stream or lake; and basic instruction in meteorology and soil science.

A unique, urban demonstration forest is now in its second year in Los Angeles. It occupies land bordering the Hollywood freeway and several lots owned by Universal Studios, one of its sponsors. Other sponsors are the forest product industry, Los Angeles city and county schools and the Los Angeles county forestry department.

In Michigan we have a dynamic program of school forests and professional foresters have been guiding the program for years.

Composition of the Advisory Committee

My third point is in regard to the language of the bill. While its purposes are clear and constructive, we suggest several improvements.

We would recommend that section 2 be amended by the inclusion of a subsection (c) which would spell out in clearly defined language the objectives of the legislation. The terms "environmental quality" and "ecological balance," while perhaps convenient shorthand labels, are too subjective and open to too many interpretations to be useful.

Section 5 only broadly establishes the qualifications for members of the critically important advisory committee on environmental quality education. The language in the bill,

> . . . persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology. . . .

should be amended to show the qualifications of each of the various members so that the advice of the committee will merit the highest possible respect and attention.

I have served as a member of the McIntire-Stennis Cooperative Forestry Research Advisory Committee since its formation in 1962. My experience there compels me to commend that portion of the enabling act which prescribes the composition and authority of the advisory committee.

Specifically, the act establishes the representation by agencies and interest groups and spells out a balance. The greater breadth of the legislation you are considering

would seem to require that the act specify that the secretary of health, education, and welfare appoint members from the specified categories that fit the objectives of the bill. We, for instance, would like to see representation for:

First, primary industries directly concerned with land use, such as agriculture, forestry, mining, petroleum, and grazing;

Second, other manufacturing industries whose operations directly involve important environmental considerations such as automotive, chemicals, paper, food processing, and metallurgy;

Third, antipollution agencies of federal, state, county, and municipal governments, including the Public Health Service;

Fourth, educational institutions, the media, consumers, and the general public, with the chairman being selected from this group;

Fifth, housing specialists and urban and rural planners.

Such a distribution of influence among these several categories would assure that programs would be focused upon common, attainable objectives without regard to special interests. Also this would keep the programs in touch with the realities of technology and economics.

Recommendations of the best-qualified persons to be appointed to the advisory committee should be solicited by the secretary from among the groups cited. The committee should be given specific authority in relation to the commissioner because of the unique aspects of federal involvement in curriculums.

Public Law 87-788, which established the McIntire-Stennis advisory committee for federally assisted forestry research at land grant colleges, and Public Law 91-211, which created the advisory council for federally assisted mental health programs, are excellent examples of legislative description of the membership and duties of advisory councils. An environmental quality education advisory committee formed along these lines would go a long way toward assuring maximum acceptance of the concepts of this legislation and cooperation with citizen, educational, manufacturing and other organizations. . . .

The forest products industries are pleased that we have been given the opportunity to share our information and ideas with you here today.

Thank you.

Portion of the Statement of Dr. Casey E. Westell, Jr., General Woodlands Manager, Packaging Corporation of America

Potential progress in forestry, particularly in our publicly owned timber lands and in the application of new scientific methods of forest management in this country, we believe, has been handicapped because of lack of understanding and knowledge on the part of many of our citizens. Not a few of those opposed to more progressive forest management are Members of Congress, and, therefore, obliged to make decisions on laws affecting our forest resources.

Allow me to illustrate how the task of our industry functioning in a setting of environmental illiteracy can be extremely difficult, and on occasion, impossible.

Perhaps, nowhere has public misunderstanding been greater than in connection with the redwood trees. Many believe they grow only in Northern California, but they actually thrive on five continents. Many believe redwoods are in danger of disappearing, but foresters calculate there may be more redwoods now than when man began to utilize them. Many believe they are the oldest living thing on earth, but they are the fourth oldest known species of tree in California. Many believe that redwoods living today were here "when Christ walked the earth," but the greatest age so far determined by an actual count of the growth rings is just over 2,200, the conclusion of a half century of sampling and studies shows less than three percent of the old growth trees are over one thousand years old, and the lifespan maximum is normally from five hundred to eight hundred years. Many believe the forest products industry cares only about cutting down trees, but many of the majestic groves of superlative redwoods in 29 State parks and the new Redwood National Park in California were either donated by private redwood companies or were set aside from cutting in cooperation with the Save-the-Redwoods League and the State of California while the companies continued to pay the taxes on the land for decades. Many believe that natural growth trees are somehow special, but under the scientific management practices of privately owned producing forests, new young-growth redwoods may equal the height of the mature giants in less than a man's lifetime.

I would submit, gentlemen, that if the foregoing opinions were put in the form of a quiz, hardly one person in one hundred could come up with the right answers. . . .

Exceptionally few graduates of our public, and private schools today have even a minimum appreciation or understanding of the basic facts of the ecological web of life and man's place in it. So long as man does not possess these facts, he will continue to defy and to destroy nature. He will not even have sufficient knowledge to enact appropriate laws to protect himself from himself. . . .

Should Representatives of Industry be Included on the Advisory Committee?

Mr. Brademas. I noted you gave particular attention in your statement, Dr. Westell, to the composition of the advisory council contemplated in the bill and that you suggested that there should be spelled out representation for the several primary industries in the United States. How would you decide which industries ought to be represented? All of them?

Dr. Westell. I can't give you a clearcut idea on all industries that should be represented. Our feeling is that the primary ones—agriculture, forestry, and others regarding our natural resources and then manufacturing—should receive some recognition.

Whether this is one individual or two, I wouldn't be prepared to say at this time except that we feel strongly that these areas have real contributions to make to the teaching of ecology and environmental sciences. They should be called upon formally by such legislation to make these contributions, to make sure that the latest knowledge, technology, and practice is being infused into the curriculums, if this is the route the legislation will take.

Mr. Brademas. It is, I think, somewhat more complicated. On a commonsense basis, we ought to stay away from your own industry for a minute, to try to be more completely objective about it. You take mining, which is a primary industry. Unless you have a 100-man advisory council, in which case it gets rather cumbersome, whom do you put on it? Do you put the mineowners or the mine, mill, and smelter workers, or do you put a member of the United Mine Workers on?

Dr. Westell. I don't think that is quite the problem; rather, it is to get someone competent in mining. He could be an employee of the industry directly, or indirectly, or

he could be a professional person that works with the industry. He could be a professor from a university. But the idea is that the practice, the technology, and the philosophy of mining and all the other things that go along with it are somehow considered formally in the teaching of environment. It is an extractive industry, but they have enlightenment in the area of conservation and have had for years.

Mr. Brademas. I am afraid you really got me down the wrong path with that point of view. I was quite interested in your [written] statement . . . that "Previously, industry advisory groups were established, altered, abolished, and considered at the whim of the administrative agencies. They were so handled that they constituted a rubberstamp for agency plans."

From my observation around this town, that is 100 percent wrong; it is the other way around and that is causing profound apprehension in this country right now. I am not talking here particularly about forestry, about which I really don't know very much at all. Mr. Meeds is very well informed on that. You can take a whole variety of regulatory agencies in the United States and I think that what is causing as much concern on the part of so many people in this country is that the regulatory agencies have been captured by the industries that they are supposed to regulate.

Anybody that doesn't know Washington, D.C., doesn't know the first thing about the American political system. You could rattle off almost every major economic activity in the country and make that point.

I am not going to bother to name names here this morning, but you can't pick up a newspaper in this town these days, without seeing more evidence of the validity of this proposition. So I am not singling out forestry for any particular criticism in this respect, but I guess what really fills me with the most profound apprehension is turning the public policymaking control in a program of this sort over to those whose record has, in part, been responsible for our needed programs along this line.

That isn't to say that I don't think we ought to open our eyes and ears to whatever views and information may be able to be afforded by a particular industry. But I really grow apprehensive at the kind of suggestion that you make here, to be very blunt about it.

We write an environmental education program and then we turn it over to the polluters. I don't understand that.

Dr. Westell. I can't speak for all segments of the industry and I am certainly not going to defend all of the other areas you have introduced here. But if this advisory committee appointment was to a competent, dedicated, and proven professional, there isn't any professional that I know that can be controlled in the professional matters by his employer.

Mr. Brademas. There isn't?

Dr. Westell. Not in professional competency. I am a manager, and I am subject to the pressures or to the instructions of my superiors in the conduct of the business. But my employer doesn't dictate my professional conduct. He never has in 15 years and never will.

My point is simply this: I am approaching the problem academically on a professional basis. Whether I am a professor in the university or an employee in the industry shouldn't have that impact on my professional conduct.

If it does, it is reprehensible and the man is not truly a professional. So I would ask you to examine the appointments on that basis and go, for instance, now to the McIntire-Stennis group, which has seven industrial appointees and seven from public life. There have been no conflicts. I simply say, "Look at it, talk to the people involved, talk to the USDA and see whether there has been serious conflict." It has been quite gratifying to me. I think that here is the first time in my career where I can get up at professional meetings, at industrial and public meetings and say, "McIntire-Stennis is really getting its money's worth for the people in this country and deserves your support."

It is something of a paradox, asking for more money, more taxes; however, I am confident that the money is being spent properly.

Mr. Brademas. I appreciate what you are saying. I don't want to be disagreeable about it, but the difference between you and me is I believe in original sin. All you have to do is pick up the paper about a week or so ago, and look at the jobs taken by former members of the Interstate Commerce Commission. Where do you think they go to work, for the American Forest Products Industry? They go to work for the buslines, they go to work for the trucking lines, they go to work for the railroads.

That is not a syndrome calculated to inspire confidence in me in the integrity of these regulatory commissions and the same point could be made with respect to the Federal Communications Commission. Everybody knows that around this town.

I am not saying anything that ought to be the most astonishing—I don't want to badger you about this. All I am saying is that I think it would be the kiss of death to this legislation if it appeared that in an effort to educate Americans about the dangers to our environment, we were to stack the advisory council with persons who could not unfairly be represented as being captives of some of the major economic activities in the United States that had, by virtue of their failure to adopt more ecologically sound practices, led to this burgeoning crisis in the United States and the enormous sense of public outrage.

I think you can understand my point of view, even if you don't agree with it.

Dr. Westell. You are the professional in this. Can't you conceive of a structure, of a balance that would preclude this possibility as it has in, say, the McIntire-Stennis?

Mr. Brademas. Yes, I think your point is very well taken there, Dr. Westell. I would not want to lead you to think for one minute that I would be opposed to representation from industry on such an advisory council. I don't think that would be fair either. All I do want to get across is I think we have to be very careful, not only to be as pure as we can be, but to appear to be pure, if we are going to have public confidence in the integrity of the programs that are authorized under this bill. So I like to think that we are not quite that far apart as our colloquy might indicate. But your suggestions have been most stimulating and interesting.

. . .

Thank you very much, indeed, Dr. Westell. Thank you very much, sir. We appreciate your testifying before us.

The subcommittee is adjourned. We will meet tomorrow morning in New York City.

(Whereupon, at 10:50 a.m. the subcommittee adjourned, to reconvene on Saturday, April 11, 1970, in New York City.)

DAY 8

House of Representatives, Select Subcommittee on Education
New York, New York

April 11, 1970

On Day 8, one of the two sessions held in New York City, the subcommittee interviewed a wide variety of witnesses, including a sanitationman, an attorney, an elementary teacher, and a state-level environmental education administrator.

John DeLury, President of New York City's Uniformed Sanitationmen's Union, drew a vivid word-picture of the devastating litter and garbage problems with which his "practical ecologists of the city streets" must cope every day. He blamed at least part of the problem on the fact that individuals are not educated to take personal responsibility in reducing their own output of pollutants. Money for sanitation equipment and manpower cannot do the job if individuals continue to generate garbage at a increasing rate.

David Sive, a Sierra Club attorney, presented an article, "The Law and the Land," explaining the barriers to legal action in the area of environmental problems. He used as an illustration the "Scenic Hudson" case, in which several private environmental groups sought without success to block Consolidated Edison's construction of a power plant at Storm King Mountain on the Hudson River.

Arlene Weisberg, a teacher at the Wave Hill Center for Environmental Studies in the Bronx, asked that the bill give special priority to intensive teacher training and immediate dissemination of experimental versions of materials. We cannot wait for "finished" materials and long-term training programs. She described the work of the Wave Hill Center in both these areas.

Edward Ambry, director of the New Jersey State Council for Environmental Education, also emphasized the need for rapid dissemination of available materials. He described the development work that has already been done by outdoor, conservation, and environmental educators who have been in the field for years and stressed the need for collecting, evaluating, and disseminating information about this work. Rather than "re-inventing the wheel," we should build from this base. Ambry also outlined a proposal for a National Center on Environmental Education.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 305, Federal Building, 26 Federal Plaza, New York, N.Y., Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, and Reid.

Staff members present: Maureen Orth, consultant; Arlene Horowitz, staff assistant.

Mr. Brademas. The Select Subcommittee on Education of the House of Representatives will come to order.

We are very pleased to be in New York City today for further consideration of the bill H.R. 14753, the Environmental Quality Education Act. . . .

[*The Chairman here gave a brief explanation of the purposes of the bill. He then introduced Mr. Scheuer, who spoke briefly on the evolution of the bill, and Mr. Reid, who made a few introductory comments.*]

. . .

Introduction of John DeLury, President, The Uniformed Sanitationmen's Association

Mr. Brademas. Our first witness this morning is Mr. John DeLury, president of the Sanitationmen's Association. I will call on Mr. Scheuer at this point.

Mr. Scheuer. I want to thank Mr. DeLury for coming here today. Mr. DeLury is one of the men in New York City who have perhaps critical responsibility for our urban environment, how the city looks and feels, and how it relates to the individual.

He is a man of enormous responsibility. He is a man who works under tremendous pressure for the thousands of men whom he represents in the top policymaking activities in which he is engaged. I think it is an indication of his civic concern and tremendous involvement as a civic leader in every aspect of the welfare of New York City that he has chosen to come out here today.

So I want to thank him and welcome him and also thank the very impressive group of delegates from his union whom he has brought along to share the privilege of listening to him this morning.

So thank you very much, Mr. DeLury, for coming.

Mr. DeLury. Thank you for your kind words, Jim.

Mr. Chairman, on behalf of the 10,500 members of the Uniformed Sanitationmen's Association, I strongly support H.R. 14753, and urge its immediate adoption.

It seems as if America is waking up to the damage being done everywhere—to the air, water, and soil. I hope that this new interest will be sustained—that it will not be a passing fad for the students, the media, and politicians. I am disturbed by the effort to find scapegoats, one-shot cures, and sure-shot gimmicks. But that won't clean up our physical environment. It will only add to the pollution in the air.

The faddists can always find another fad, but we sanitation men, the practical ecologists of the city streets, must stay with the almost impossible job of striving to keep the capital city of the world clean.

I have endorsed H.R. 14753 because it points to a crying need—the need to educate the people—and because it provides the money to educate in this specific area.

The Urban Priority

I have endorsed H.R. 14753 on the assumption that money for the required educational programs will be available in the first instance to the cities of our country.

The cities are where the people are.

The cities are where the air pollution is.

The cities are where the congestion, slums, rats, vermin, dirt and decay are.

New York, the city I know best, cannot now cope with the pollution of its streets and its garbage problem, in spite of its budgetary allocation.

Yes, additional funds for additional manpower and equipment are clearly necessary. And yet without an educated citizenry more money won't buy the needed results.

Our city is a polluted city. And pollution of our streets is a lasting impression with which visitors leave. Is this inevitable? Is it a necessary byproduct of our size, density and congestion? Almost eight million human beings live here. They occupy 742,582 residential dwellings. Daily they are joined by another two million people coming from the suburban bedrooms around the city to make their living here. Two million automobiles find their way into Manhattan each day.

This population living, working, and consuming here, generates more than 10,000 tons of garbage a day. They abandon 60,000 cars on our streets which they no longer want. Our 6,000 miles of streets are, for many, their litter baskets and garbage cans.

How does the city cope? What does the administration do to prevent the people from choking on their own swill and being asphyxiated by the gas fumes of their own cars?

$353 million is the cost. That's the current annual budget for the Environmental Protection Administration. More than half that amount goes for sanitation services. That makes possible the daily employment of 14,000 people, of whom 10,500 are sanitationmen. They are the men who go into the 6,000 miles of streets. They are the men who go to the doors of each of the 742,582 dwellings. They are the ones who collect the 10,000 tons of garbage a day and they clean the 12,000 curb-miles in the city.

They use 3,047 trucks of all types. The cost of this equipment is $60 million.

They dispose of this waste in eight huge incinerators, four landfills, and eight marine stations, using cranes, bulldozers, 40-yard trucks, conveyors, barges, and tugs whose costs exceed $30 million.

That's the city's effort. In addition, another 2,500 tons of garbage, waste, and construction debris collected privately are disposed of by the city each day.

The end is not in sight. Each year sees an escalation in waste generation of nine percent. And this is the situation throughout the country. A leading business magazine recently estimated the cost of waste removal to be $5 billion a year nationally, with a cost increase of 20 percent a year. (*Forbes* magazine, Jan. 15, 1970, page 18.)

Anti-litter Education

Yes—more money is needed from all sources—local, state, and federal. More capital equipment is required. But in addition, the people have a role; they can and have to help. H.R. 14753 can provide the means of educating people so they will help.

People, not some impersonal corporation, are the street litterers. People abandon their cars and scatter garbage on the city streets. If this pollution can be curbed at the source, then our city will be cleaner and the nation's cities will be cleaner.

Education must begin in the schools with the kids. The adults must be reached through television, radio, and the press. There must be booklets, clean-up drives, stay-clean drives. No one-shot gimmicks, but sustained effort and constant education are needed.

H.R. 14753 can mark the beginning of this education and re-education until finally we develop pride of neighborhood and we see dignity in cleanliness.

One final thought. This type of education is also needed with those who supply our daily needs. Much has already been written about the responsibilities of the utility com-

panies and the oil companies. I need not develop this point further. But our newspapers, a primary source of education, are ironically enough in the forefront of those who tax our public resources.

Take our Sunday papers in New York as an instance. The table which follows shows the cost of removing only two Sunday papers—the *Times* and the *News*. That costs the city a staggering $13,260,000—or 7.8 percent of our total sanitation budget.

I am not suggesting that the *Times* and *News* not publish Sunday editions. That would be like saying religion has to go. I am suggesting that those who contribute to the burdens should pay the costs, at least in part.

Mr. Chairman, there are no total answers. We must seek and find partial ones. Your bill is a partial answer with profound consequences. That's why I urge its passage.

If there is anything we can do, to insure that end, it will be done. [Applause.]

When Garbage Became Important

Mr. Brademas. Thank you, Mr. DeLury, for a most useful statement. I am particularly impressed by your characterization of the sanitationmen as the practical ecologists of the city streets. It is a very telling phrase.

Let me ask you this question. What can you tell us about what kind of efforts are made in the city of New York to provide education in your elementary and secondary schools about pollution control, natural resources conservation and environmental problems, generally?

Mr. DeLury. Nothing at the present time. About six years ago, we had in the Department of Sanitation a unit of professional sanitationmen and officers to go into the school and talk to the children. That has been eliminated. We had motion pictures to show the children in the schools. That's all gone by the board. Nothing is being done.

Garbage was not important in this town, Mr. Chairman, until we had a strike in February 1968 and then all of a sudden everyone realized the impact of garbage on the community and from that time they have been getting to realize that sanitation is a primary function of the Department of Sanitation.

It may amaze you. Ten years ago we had 6,000 men who went out into the streets manually to sweep and clean the streets. We have less than 400. Included in that 400 are those who operate the power broom.

Now a power mechanical broom in New York City is like me needing an additional head. You can't get to the curb to clean it because New York City is the largest garage in the world, parking on both sides of the street, double parking and triple parking. We can't clean it with mechanical equipment.

What we actually need—and I have been saying this again and again—is for men to be out mechanically with the broom and with that pushwagon we have to get in and clean it.

And another thing we used to do that no longer we do: Where it's a lot of heavy debris that you can't get in and sweep it out, we used to hand-flush it—come with a hose and flush under it and force it out so we could get that. All of these things have disappeared.

Mr. Scheuer. You can do the hand-flush under the parked cars?

Mr. DeLury. Yes, sir.

Mr. Brademas. I would hope, Mr. DeLury, at least in the light of the extraordinary amount of money that must be spent in a great city like this—that must be spent for removal of garbage and refuse—that at least in time one of the great values in the kind of environmental education program that we contemplate in this bill would be that you would reduce the cost to the city of collecting the garbage, because you would, as you have already suggested, educate the citizenry to practices that would be far less demanding on the city's resources.

Garbage Disposal: How and Where?

Mr. DeLury. Mr. Chairman, it must get more expensive. Although it is not within the scope of this subcommittee, our major problem is our union says three years—the city says five years—you are in a congressional district here—in San Francisco, Philadelphia, a year and a half or two years.

Where are we going to put it in five years?

I hear you saying, 10, 20, 30 years ahead. We don't have the time.

Where are we going to put it, assuming we can collect it in the street, all the garbage that's vomited out? Where are we going to take it? Put it to sea?

Mr. Reid. If the chairman would yield.

Mr. DeLury. Westchester has a problem, too, Mr. Congressman.

Mr. Reid. A kind of serious one. I wanted to ask you about two specific suggestions ecologists are very interested in. One is [about] the recycling and utilization of certain material after processing, such as is being done in Israel.

The other question I wanted to ask you is: What are the possibilities of compacting garbage with the new techniques? I gather you have even got a home compacting unit at this point. I don't know the cost.

Mr. DeLury. I don't know the cost either. They have tried it throughout the world. The only place where I know they do anything with it is in Japan and they construct homes with the packages.

I know that part of your Department of Health, Education, and Welfare—I have met with them and they were suggesting that they compact it, take it out into the middle of the ocean and drop it.

But we are thinking of a total picture and thinking in time, and I am going with you, 10, 20, 30, 40, and 50 years. The ocean is fillable.

There is only one way to destroy garbage and that's by proper incineration with high B.t.u. unit of heat that will completely dispose of it at 3,200°, 3,300°, 3,400° of heat.

All of these gimmicks I have heard since I have had the honor of representing this union, even to making wood alcohol out of the garbage, even to taking paper back and reclaiming paper, reprocessing paper. It all failed, it all fell by the roadside.

Take all the abandoned cars. I am talking about 60,000

cars we took off the roads, off the streets of New York City last year, and next year it will be 80,000.

Mr. Reid. What suggestions do you have Mr. DeLury—because I think you made a very thoughtful statement here—to answer your own question of where do we put it? What new techniques were brought in which would be helpful?

Mr. DeLury. Modern incinerators such as they have in Scotland. I believe they have a plant in Germany, and this is only one way.

Mr. Reid. This is the high temperature?

Mr. DeLury. Right.

Anti-incineration Pressures

Now, you have a major problem there. There isn't a politician in New York City that is going to stand up to the pressures that's brought upon him by his local constituency when they say, "Let's put a site here."

Jim, up in Hunts Point when they wanted to put a marine disposal unit there or incinerator, the community rebelled.

Where are we going to put it? They will not allow it in any part of their areas and, politically people being as they are—and I can't blame them for it—they have to be re-elected and they are not going to fly in the face of their local constituents.

This problem must be handled by Washington, the federal government, because it is harder to get out a man that's elected by 50 states than a man that's elected in a local election like New York City, White Plains, or Westchester.

Mr. Reid. Of the amount of garbage you mentioned that you collect—10,000 tons plus the 2,000 collected privately—how much of that is incinerated and how much of it has to be placed in some form of landfill or taken out to the ocean?

Mr. DeLury. Six thousand tons per day goes into the incinerator of which 2,000 to 2,500 tons reverts back to what we call residue, the unburnable, and [is] taken to landfills or waterfront disposal places and taken out and dumped.

Sixty percent that's collected goes to the incinerator, of which 35 percent or more then reverts back to the landfills and the waterfront disposal places.

. . .

Mr. Brademas. Thank you very much, Mr. DeLury, for your support.

. . .

[*The next witness was J. G. Harrar, president of the Rockefeller Foundation. He offered a brief statement and answered questions.*]

Introduction of David Sive, Attorney, Sierra Club

Mr. Brademas. The Chair recognizes Congressman Scheuer to present our next witness.

Mr. Scheuer. It is a great pleasure for me to recognize perhaps the nation's most distinguished environmental lawyer, David Sive. I want particularly to welcome Walter and Teddy Sive who have accompanied their dad and constitute, I know, his real brain trust.

I would ask for your unanimous consent for an article by Mr. Sive, entitled "The Law and the Land," to be printed in its entirety before his oral testimony.

Mr. Brademas. Without objection, it will be included.

(The article mentioned above follows:)

THE LAW AND THE LAND*

By David Sive

Every great social movement turns to the courts as well as to the legislatures. In the decade just ended, our courts—at times as much as and perhaps more than our legislatures—led in the evolution of the particulars of meaningful civil rights and racial equality. The executive and legislative declarations of war on poverty were quickly followed by the birth and rapid growth of a field of law unknown in the preceding decade—"poverty law."

Now the environmental crisis has spurred the great new political and social movement of the 70's. The liveable environment movement will be the man of which the child called the conservation movement is the father. It has begun to move into the courts and create a new body of law, the name and identity of which has been established within the last twelve months—*environmental law*.

Consequently, there are some important and obvious questions which merit examination outside the traditional law journals. For example, what role will be played in the development of this new body of law by the individual citizen and the citizens' groups representing the numerically overwhelming and, hopefully, not-too-silent majority? What special problems must be met? What novel issues must be litigated so that new doctrines of environmental law can develop? What is the relationship of the litigation process to the political process?

Environmental law is essentially the law prescribing the respective rights of two classes of contestants in our lands, waters, and air. The identity of one contestant seldom varies; it is the general public opposing a particular disposition of resources—the citizens of a city or village to be bisected by a road, of a river valley to have its crowning scenic glory cut away, or of a whole nation fearing a Silent Spring. The identity of the second contestant varies according to the nature of the proposed disposition. It may be a utility or manufacturing company seeking a license from a government agency. It may be the government agency itself.

In the cases in which the respective claims to and rights in resources have been litigated, the representative of the general public has most often been either an *ad hoc* citizens' group, formed for the purpose of the particular contest, or one or more of the major national or regional conservation organizations, foremost of which have been the Sierra Club and the National Audubon Society.

Unequal Contest

The contest is substantially unequal. The corporation or government agency has virtually unlimited resources of money and all that money can buy—lawyers, expert witnesses, printing, models, charts and other exhibits, and all of the multitudinous goods and services that go into a major lawsuit. The conservationist group must recruit and organize largely from volunteers. It must appropriate from a deficit budget or conduct house-to-house campaigns to raise small sums from large numbers of people. This latter process, involving the use of neighborhood committees and all the other accepted techniques, is not essentially different from fund raising for construction of a new hospital or church wing.

Funds are needed for expert witnesses in cases in which the services cannot be secured free. If the hearing or trial is any considerable distance from the residence or office of such witnesses, travel expenses mount quickly. The fact that the witness may be

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required to testify on a date not chosen by him, but chosen by the court or administrative agency before which he testifies, may also prevent rendition of services wholly without compensation.

The attorneys representing the conservation organization must be willing and able to contribute most or all of their time and skills to the litigation. Of all the significant cases thus far brought, some of which are still pending, in none—to the knowledge of the writer—have the attorneys received more than a small fraction of their fair compensation. In cases in which the issues are exclusively legal, with no important factual issues to be tried, the task is generally manageable. This is because the work schedule is controlled by the attorney. He may devote evenings or weekends or daytime hours when other matters are at a lull. In cases in which issues of fact are to be tried, there is no way for the attorney to avoid the out-of-pocket loss of fees on commercial matters which he must turn away. Therefore, it becomes impossible for the conservation organization's attorneys to serve completely without compensation.

Several factors aid the conservationists. The recruitment of expert witnesses who may testify for little or no compensation is aided by the fact that universities and university towns are always conservationists' strongholds. The sudden and explosive involvement of students in our environmental crisis—to be climaxed by the April "teach-ins"—is providing a fund of skilled and dedicated researchers, field investigators, proof readers, typists, and messengers.

The environmental revolution is now sweeping the law schools. Many have highly organized environmental law societies. Since much of the inequality of the conservationists' lawyer versus his corporate or government adversary is in the availability of young associates to do the long hours of legal research, law students, if organized, can be of great help. A good second- or third-year law student is almost equal in legal research to a young practicing attorney.

Novel Legal Issue: Beauty Versus Utility

What are the problems of the conservationists in court other than the basic inequality of financial resources? One is the sheer novelty of some of the issues to be tried before the courts or administrative agencies. In an increasing number of cases, starting with that of the proposed Consolidated Edison power plant at Storm King Mountain (the Scenic Hudson case), the issue is beauty versus utility. The two must be weighed under a legal formula provided by a statute or a court ruling which provides that the protection of natural beauty is to be given due consideration.

In the Scenic Hudson case, the basic statutory formula is in the Federal Power Act governing the grant or denial of the application which requires that the project:

> "be such as in the judgment of the commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power development, and for other beneficial public uses, including recreational purposes. . . ."

The place of beauty in a "comprehensive plan" was stated in a now-historical sentence in the opinion of the Court of Appeals which reversed the original grant of a license to construct the Storm King Project. After pointing out the errors of the Commission in its granting the license to Consolidated Edison, and requiring new proceedings in order to receive additional evidence, the Court described the fundamental questions which the renewed hearings were to examine. They must, it said:

> "include as a basic concern the preservation of natural beauty and of national historic shrines, keeping in mind that, in our affluent society, the cost of a project is only one of several factors to be considered."

The intervenors opposed to the Project, primarily the Scenic Hudson Preservation Conference and the Sierra Club, relied upon this statement of principle of the beginning of the adoption of a different philosophy in our developing law of natural resources. Thoreau phrased it this way a century ago:

> *Most of the luxuries and many of the so-called comforts of life, are not only not indispensable, but positive hindrances to the elevation of mankind.*

While the society of Thoreau was not "affluent," ours certainly is, at least in that by applying to our social and economic organization some small fraction of the intelligence we apply to going to the moon, we can provide every person with all the necessities and some of the comforts of life.

Beyond those necessities and "necessary" comforts, we must make a choice of goals, and perhaps the choice should at least sometimes be to elevate, rather than fatten, mankind. Scenic Hudson and the Sierra Club have interpreted the mandate of the Court of Appeals to require a sophisticated analysis of the nature and degrees of scenic beauty. Their position has been that scenic beauty can be objectively analyzed, and degrees of beauty stated.

Analyzing Degree of Beauty

Both Scenic Hudson and the Sierra Club did analyze the degree of beauty. They produced testimony of several experts on scenic beauty, including Professor Charles W. Eliot, II, of Harvard; Charles Callison, Executive Vice President of the National Audubon Society; Professor Vincent Scully (History of Art), of Yale; and David Brower, Executive Director of the Sierra Club. All of them testified that Storm King and the Hudson at Storm King were not simply places of scenic beauty, but the supreme river scenery in eastern United States.

Mr. Callison called the Hudson at Storm King "the most beautiful stretch of river scenery in the United States." Professor Scully's description was perhaps the most lyrical. He described Storm King Mountain as follows:

> *It rises like a brown bear out of the river, a dome of living granite, swelling with animal power. It is not picturesque in the softer sense of the word but awesome, a primitive bodiment of the energies of the earth. It makes the character of wild nature physically visible in monumental form. As such it strongly reminds me of some of the natural formations which mark sacred sites in Greece and signal the presence of the Gods. . . .*

Each of the several experts classified the Hudson at Storm King as equal in scenic beauty and magnificence to many of our national parks.

The beauty of the mountain and the surrounding area has not been seriously disputed by the Company, although Con Edison has not accepted the conservationists' analysis of degrees of scenic beauty. The Company's principal point has been that the project would not mar the beauty of the mountain, because from most angles at most seasons of the year it would not be seen. The issue of the precise visibility of the project works was the subject of many hundreds of pages of conflicting testimony.

The claims of Scenic Hudson and the Sierra Club, that the construction of the project and of the attendant facilities would seriously damage the value of the mountain and the surrounding area as objects of natural beauty, are not based solely, however, upon the degree of visibility of the project works. They have raised an issue of the effect of the project upon the integrity of the mountain itself. This point, the "integrity of the mountain," was made in the testimony of another of the Sierra Club witnesses, Richard Pough. His point, essentially, was that the ultimate value of scenic beauty is its impression on and in the minds of the persons who perceive it.

Even though much of the project works may be camouflaged by paint, plantings, artificially roughened rock, and other devices, if those who perceive the mountain and the surrounding area understand that the mountain is subordinated to the project, the end result is appreciation and admiration of engineering works, and not of the works of the Creator of the mountain.

The point is summarized in the following extract from the Sierra Club's principal brief:

"It is the character and 'integrity of the Mountain' and the surrounding areas that must be borne in mind in determining the extent to which the Project, and all that goes with it, will mar the natural beauty of Storm King and its environment. If its meaning is changed, in the eyes of those who behold it, its supreme value as a preserver and embodiment of the spirit of . . . New

York . . . to a whole nation, particularly the vast millions in its greatest metropolitan area, is forever lost. In that event, no combination of orders of this Commission, funds of the Applicant, and skill of its eminent landscape architects, can be any more successful in putting the earth rocks and trees of Storm King back together again, than were 'all the king's horses and all the king's men' in the case of Humpty Dumpty. Painting concrete green cannot deceive its beholders into believing that it is the handkerchief of the Lord, or, if it can, this Commission should not, in the absence of some overwhelming economic necessity, direct such deception."

In increasing numbers of cases under the same or similar statutory and court criteria as in Storm King, courts will have to balance cost against beauty, to determine what really contributes to "the elevation of mankind."

"Standing in Court": Who Can Represent the Public Interest?

A second historic legal problem for conservationists, that of "standing in court," is probably a thing of the past. The basic Storm King ruling, that "those who by their activities and conduct have exhibited a special interest in [the] areas . . ." of "the aesthetic, conservational and recreational aspects of power development," has been followed in several other important cases. These include those in which a federal district court has enjoined a $200,000,000 expressway to be built in the Hudson River valley. The broadening of standing in the conservation cases is also only one aspect of a lawyer movement of the law upholding the standing of groups of persons with non-pecuniary interests in Federal Communications Commission cases and the reapportionment cases.

In the FCC cases, by far the most significant is the decision of then Circuit Judge Burger, now Chief Justice of the Supreme Court, in the "United Church of Christ" case, in which he rejected a challenge by the FCC to the standing of a group of citizens of Mississippi who complained that a radio station was guilty of racially discriminatory programming.

Of course, for success in court a conservationist group must have more than standing. The court must have jurisdiction of the subject matter and, most important, there must be something substantively illegal about the project under attack.

Problems of Court Jurisdiction

Any meaningful discussion of jurisdiction of the subject matter necessarily involves a greater number of technical questions of great subtlety. Only a few basic points can be made here, the first of which concerns sovereign immunity. The doctrine of sovereign immunity—that the sovereign United States or any one of the fifty sovereign states may not be sued unless it specifically consents to suit—is, to some degree, a cross we may still bear from the days when the law said that, "The King can do no wrong." That was, of course, simply another way for the king to assert his chief claim to immortality by ruling: *L'Etat, c'est moi.*

The rule of sovereign immunity, precisely because of its inherent injustice and its basic contradiction of our *consent of the governed* theory—our belief that the most just and beneficient of all sovereigns has granted us "certain inalienable rights," among which are "life, liberty and the pursuit of happiness"—has had large sections cut out by both statutes and judicial rulings. Some shreds of it still remain, however, and when lawyers for a governmental agency or for a utility company granted certain governmental powers such as that of condemnation, seek to avoid the substantive question of whether their projects are substantively legal or illegal, they pick up one of the shreds of the sovereign immunity doctrine.

Whether any such shreds remain in a case in which a court has tried the issue of the substantive legality of a project and found certain integral aspects of it illegal, is a question at this moment before the Second Circuit Court of Appeals in the Hudson River Expressway case, and which may be before the Supreme Court before the summer of 1970.

Review of Administrative Decisions

The second jurisdictional problem which can be indicated here, without involvement in discussion suitable only for law reviews, is that of the reviewability by courts of administrative rules and determinations. It is an interesting irony of history that in the Thirties and early Forties—the New Deal period—the persons and groups fighting for broad reviewability of administrative decisions were primarily right of center. They looked to the court to stem the tides of social and economic reform being effected by the National Labor Relations Board, the Securities and Exchange Commission, and other New Deal agencies. "Big government" was evil to those on the right; it was salvation to those on the left.

In large part, the struggles of the conservationists and environmentalists are now struggles against big government. Virtually every important project that would appropriate for a special use any resource which the conservationists seek to preserve, by representing what they hope is a large majority just awakening from silence, involves approval or actual construction by a government agency. Unless some mechanism exists for review by an agency of government whose orientation and training is general, conservationists feel that literally every river, mountain, plain, and city will be appropriated by the Federal Power Commission, the Army Corps of Engineers, the Atomic Energy Commission, or some other administrative agency whose purposes and *raison d'etre* are parochial.

The Army Engineers' conviction that dams solve all problems—in modern times, if not in the days of Noah's troubles—has been documented. The Federal Power Commission's world is that of power. More kilowatts are, to them, synonymous with progress; and to oppose progress as defined by utility companies is to oppose the principles upon which our nation was founded.

Reviewability of administrative decisions by courts has two aspects: First, is review provided for? Second, what is the scope of review? Some of the determinations of many federal agencies—such as the Federal Power Commission and the Interstate Commerce Commission—are specifically made reviewable by statute. But review of many agencies' rulings is not specifically provided for in the statutes creating them. Included in the second category are the Army Engineers, agencies of the Department of Agriculture and Department of the Interior, and others whose powers of appropriation of resources are vast, even frightening. The line drawn between the agencies whose determinations are specifically reviewable and those not specifically reviewable is a line drawn by accidents or patterns of history which have no relationship whatsoever to the size or importance of the projects or other actions which are the subjects of the determinations.

Moreover, the kinds of decisions specifically reviewable are mostly those which determine private rights, such as those to build a power plant or to prospect for gold on the public domain. It is an interesting aspect of our laws, and perhaps of our scales of values, that the rights to appeal from a determination of a zoning board as to whether children may erect a tree house or a family add an upstairs toilet to their home, by both the applicant and the opponent, are clearly and precisely drawn; but the rights of a whole community or group of communities to secure court review of a determination by a road-building agency to literally destroy them are not at all clear!

Fortunately for conservationists, the rule emerging from recent Supreme Court and lower federal court decisions requires rejection of any contention of non-reviewability unless review is specifically forbidden by the terms of the law creating the agency or unless that is the necessary and clear direction from the law's legislative history.

The more grave problem is that of the *scope of review*. It is the all-but-universal rule of court review of the rulings of administrative agencies that the scope of review is very narrow. The court may not retry the issues. Only if the administrative decision has no rational basis or no real evidence to support it, or for some error of law, may the court reverse it. This rule places a hard enough burden on the litigant in the ordinary case where there is a limited record of clearly identifiable papers and proceedings upon which the administrative decision was based, and only one or a small number of agency personnel investigated and determined the matter.

Without some error of law, it is an almost impossible burden upon the citizens' group litigating the factual issues when the project is vast. The record of administrative action literally fills rooms with papers of every kind and description. The number and identity of persons who worked on the matter are unclear, and the agency vigorously defends its own determination. To this should be added such problems as the limited means of the citizens' committee; the remarkable talent of most administrators and their biologists, engineers, and other professionals and artisans to mask the answer to the simplest of questions in gobbledegook and erase from the dictionaries the words "yes" and "no." One can understand the reaction of most people to the first proposals to fight the project; a feeling of the utter powerlessness of a citizen against the vast monolithic government and its creeping concrete!

The beginnings of an answer to the scope of review problem may lie in the Storm King Case in which it has been held that agencies have a duty to ascertain all of the relevant facts, and not stand by blandly calling balls and strikes on the competing parties.

Action in the Political Arena

An aroused younger generation, seeing in the wedding and not the divorce or warring of man and nature the same righteousness they see in meaningful civil rights and racial justice, can push courts and legislatures to resolve this and other basic environmental problems. Moreover, court decisions interpreting laws can be overruled by changing the statutes.

In the final analysis, it is the political process which must shape environmental law. Vast numbers of statutes on federal, state, and local levels are required to define peoples' substantive rights in their lands, air and waters. The substantive illegality of a project under attack must be found in a statute or in some modified common law rule not yet generally promulgated by our courts. Many thoughtful teachers and students of law are attempting to refine theories of the existence of an environmental right *per se*, based upon present constitutional provisions or on existing common law rules. Thus far, no court has decreed such a right. The primary hope for such a right is in our legislatures.

Mr. Scheuer. Let me say that Mr. Sive is perhaps the founder of the environmental law movement as we know it in our nation today. He was counsel to the Sierra Club at the time they pressed the monumental and historic Con Edison case in which Federal Circuit Judge Paul R. Hays, who taught Dave and myself labor law at Columbia Law School, decided in a monumental case that federal agencies have a duty to intervene to seek out the truth, to seek out the public interest, to find all the relevant facts, and, as Mr. Sive stated in his article, "not stand by blandly calling balls and strikes on the competing parties."

(Discussion off the record.)

Mr. Scheuer. Dave, it is a pleasure and a joy to have you here today.

. . .

Mr. Sive. Turning to the problem of environmental education, I can go to as recently as 35 minutes ago where I passed along, coming here, Sickletown Road in Rockland County, and there is the root of our environmental problem.

Here is a road that goes through a still unspoiled area of Rockland County in which I live. It would be the most lovely lane, lovely place for any person to live and take a walk along the land.

But what is it? It is a garbage dump—garbage dumped by individuals, by the town of Orangetown, by various persons who don't want to pay what we have to pay in Rockland County, to a private purveyor of garbage.

It is dumped, and we are not going to get to the root of our environmental problem by simply forcing more duties on people or court cases or other ways in which I would try to use my lawyer's arts.

We must change the ways people look at the land and the manner in which they live.

We must somehow convince people that roadsides and campgrounds and city streets are to be treated as their own living rooms, and this can only be done through educational programs of the nature of those which I think can come out of this legislation.

Now just to give you a few examples of the limitations of law and the imposition of duties I think they are particularly important in connection with the key problem we have, which I think was alluded to by the gentleman that preceded me.

That is the basic problem as to whether we gear our national force and energy and our whole civilization toward simply a multiplication of goods and services, toward increasing the gross national product; and the most fundamental educational and political job we have in the environment is to direct ourselves toward something different from the simple multiplication of goods. It may seem as though this is what all us conservationists say and perhaps a somewhat hackneyed and trite observation, but in this all that I do is go back to one of the gods and one of the founders of our environmental movement whom many of us are going back to for many other lessons these days, and that is Thoreau. And, if I may just use this occasion—and I think he is worthy of quotation before a congressional committee, even 120 years after he wrote *Walden*—[for] just one quote which I think is the heart of our environmental and educational problem: that is that "most of the luxuries"—and I quote from *Walden*—"and many of the so-called comforts of life are not only not indispensable but positive hindrances to the elevation of mankind."

. . .

The Responsibility of People to the Land

Now if I may be somewhat romantic, let us say I would certainly believe that the function of your committee as well as that perhaps of all congressional committees is to promote the elevation of mankind, and I think we have now begun to learn that the elevation of mankind is not simply promoted by increasing the number of physical luxuries and the so-called comforts of life, and that indeed some of them may be positive hindrances to this elevation.

And this again can only be accomplished by educational programs which turn the minds of men and women and children to have a certain ethic and a certain feeling about land and resources and a certain reaction to the beauty of land.

And here perhaps one other observation which may seem somewhat basic and, again, somewhat romantic, I would like to make, now that we are concentrating a great deal on national goals and national aims, and we are also concentrating on the evironment.

Well, I have long believed that there is a very definite relationship between what is within the land in terms of its

resources and its natural beauty and the duty and responsibility of people who are in that land. And if our nation is one which is blessed with the greatest of resources and the greatest of natural wonders and the greatest areas of natural beauty, from the place where I once tried to lead Mr. Scheuer in late April in the center of the Adirondack wilderness to the Grand Canyon and the Smokey and Cascade Mountains, then certainly we have I think some higher duty to fashion some kind of ethic, some kind of principle by which we treat this land with these resources and combine that with the technical advancement and technical knowledge we have.

That is what I think this environmental bill must do. It must change the minds and attitudes of people and, until we do that, much of what we may accomplish through laws and court decisions may be of little avail. Because it doesn't really do many of us much good to, let us say, save the face of Storm King Mountain, which is the object of a tremendous legal and litigation effort, and then right along the roadside at the base of Storm King Mountain simply look at the beer cans and the discarded garbage of that town.

We can only do that through educational programs. Now I think there is just one other observation which I would make and beyond that, if I can answer any questions, I would be delighted to.

But I must again state my own limitations as not an expert on educational means and the precise techniques which are embodied in this legislation, although as far as my own inexpert judgment would be concerned, I think it is the right means to create the body which you do create and provide for the application of funds to it.

But the other observation is simply this: That there has been mentioned here this morning just before I came in and there is involved everywhere when one talks about the environment the matter of interdisciplinary approaches, and I think that is one of the objects which would be furthered by this educational program.

Well, the requirements of interdisciplinary approaches are written right now in another very basic act and this is more in the legal field, the Environmental Quality Act, which became law on January 1, 1970.

There is a matter of legal requirement that federal agencies in dealing with matters involving resources are required to exercise an interdisciplinary approach and, if the program which is provided for by the bill before your honors can provide the educational background for that, then that, too, is essential.

. . .

. . . [M]ost of our resources are governed and disposed of by administrative agencies and, if we just stay on the federal level, the Federal Power Commission, the Atomic Energy Commission, the Army Corps of Engineers, the U.S. Forestry Service, et cetera—each of those agencies is a single-interest or narrow-interest oriented. The precise way that works is documented in some of the litigations which have developed this environmental law field, including the Storm King case.

The problem is that the Federal Power Commission wants to create power, the Atomic Energy Commission believes in more atomic energy, the Army Corps of Engineers in dams, dikes, causeways and little else, much of which is documented now, and we don't have this interdisciplinary approach and that I think can be compelled if my construction of the Environmental Quality Act is correct.

. . .

Consumer Products vs. Irreplaceable Resources

Mr. Scheuer. Mr. Sive, I want to thank you for your marvelous testimony. I am only going to ask one question.

You gave us a very beautiful and moving quote from Thoreau. What do you think, as a leader in perhaps the environmental consumer movement, ought to be our education attack or political grass-roots attack on the kind of galloping GNP and consumerism you mentioned?

How do we convince the average housewife that when she buys an electric hair dryer or electric toothbrush, an electric carving knife—all of which I think would fit in with Thoreau's definition—that she is inevitably contributing to environmental pollution, since apparently there is no way of producing electric power, either through the fossil fuels, coal, oil, gas, or through atomic energy, that doesn't have a polluting fallout?

How do we convince the American family to perhaps abandon the idea of the third car and to use mass transportation?

How do we convince them to give up some of these cherished comforts and conveniences and do things in order to achieve the greater good, perhas a greater level of total satisfactions of which they may not be consciously aware now?

Mr. Sive. Well, that really gives me the floor to make one suggestion which I have stated in several places and maybe is in part an answer to your question.

I think that one of the really needed things in this whole environmental movement, and the problem of gearing our production to our elevation, is a study by a body—and it may very well be the university groups and others who would be funded by this legislation—which would run through every consumer product we have and try to figure out how much does that take out of irreplaceable resources, how much does it consume and how much hardened product which cannot be put back into the earth and water does it take away and how much does it contribute toward what we ultimately seek.

Just to give an example, you mentioned electric appliances. I would say many electrical appliances even the greatest wilderness advocates use and want, and it may well be with the proper siting we can have most of the electricity we want and not irrevocably damage the environment.

But let us take aluminum soft drink cans. Is there any difference in the world toward our elevation or even our comfort between something that can be disposable and can be turned back into the earth and an aluminum can?

None.

Take the vast amount of paper we use. I think somehow we can cut down, maybe by changing our laws to restrict and discourage junk mail. What social progress we would achieve by that alone, getting rid of some of the mail and saving several thousand acres of pine forest.

If we can go through each and every product we use, from a toenail clipper to a box of Kleenex, and try to inventory those, then I think we can begin to convince people that you are not really going to lose much.

. . .

The Environmental Movement and the Poor

There is one other problem related to this—a very basic one again—which troubles me very much and which may well be again the subject of study by groups that would be funded by this act, and that is the relationship of the environmental movement to the ghetto, to the inner city, to the groups of the population who have not achieved the affluence which enables us to turn to other things.

Mr. Scheuer. May I add, I want you to answer this question having in mind that some of us liberal congressmen have been criticized for our concern about the environment. We have been accused of copping out of the improved education struggle, improved civil rights struggle, improved urban life struggle.

How do we answer this? How do we convince the black and Puerto Rican Americans that they have as much a concern in this limited planet, this spaceship, as we do and that it isn't a cop-out but rather that it goes to the heart and core of their problem?

. . .

Mr. Sive. There are two answers. One is a theory of mine which still has to be studied but still is a theory, that if we take the total of our sum of goods and services and we more equitably distribute them and we lop off a bit like the aluminum beer cans along the road which contribute nothing toward anybody's elevation, then I think there is sufficient to distribute to those who have not shared in the affluence.

I am convinced of that, although I am not an economist, and I would like people to study that.

Second, I think it is correct that generally speaking those groups of the population who have been fortunate enough, by simple historical accident, to perhaps have gone beyond the problem of getting out of the ghetto—and I can say here I would just go back one or two generations in my own family history—it is only physically and I think figuratively when you solve that problem of the day-to-day necessities, that you can turn to matters such as the environment and the preservation of natural beauty.

If that is so, then all the more valuable and necessary and urgent is the saving of this for those who have not yet done that, because if, as I am confident, within not too long a time there can be this greater justice in the distribution of goods and if 10, 20, or 30 years from now the Grand Canyon or the Adirondacks or Storm King Mountain—if that is then gone, then those who will only share in the affluence a few years from now if we really devote ourselves to it will never know it, and that, I think, would be the ultimate tragedy.

I think that is one of the answers to this problem of relating the environmental matters to groups of the population who still don't share as much as they should in our society's affluence.

. . .

Mr. Brademas. You have been most helpful in your commentary and statement. Thank you very much.

Mr. Sive. Thank you very much, sir.

Introduction of Mrs. Arlene Weisberg, Teacher, Wave Hill Center for Environmental Studies

Mr. Brademas. The Chair would like to observe that we have four more witnesses scheduled. We would like to conclude this morning if possible.

The next witness is Mrs. Arlene Weisberg. Mrs. Weisberg, please go right ahead.

Mrs. Weisberg. My name is Mrs. Arlene Weisberg. I am employed by the New York City Board of Education at Public School 46 in district 10, in the Bronx. I am presently on leave of absence as a master teacher for the Wave Hill-Lehman College environmental studies program.

I wish to thank Mr. Brademas, the members of the committee, and the gentlemen at the hearing for inviting me to speak on behalf of the Environmental Quality Education Act (H.R. 14753).

I think that we are all agreed that environmental education is education for survival. If we do not institute a crash program to teach our children the ecological facts of life, we may not be around long enough to worry about any other educational issues.

Teachers, though well aware of this great need, are hesitant to step into an area for which there is little or no prescribed curriculum and few materials on the elementary school level. However, the world may come to an end before a satisfactory environmental curriculum is developed and implemented to meet the standards of various boards of education and local school boards.

There is a great need for intensive teacher training and for provision of experimental materials now.

How is it possible to make water pollution vital to a seven-year-old? How do we communicate the urgency for change and for positive action? A teacher standing in front of a classroom and "teaching" water pollution is not the answer.

If the child is to become aware of his environment, to see himself as an individual acted upon by the environment and in turn acting upon the environment; if the child is to realize his own potential as a change-agent, a different kind of classroom is necessary.

The Wave Hill-Lehman College program in district 10, Bronx, funded by the Ford Foundation is experimenting with environmental education with the emphasis upon the "discovery method." Many of our methods are based upon the theories of John Dewey, Maria Montessori, Susan Isaacs, and Jean Piaget and the models of some of the British infant schools. We believe that a child becomes aware of his place in the environment through experimentation with the materials of the environment. The classroom must provide many materials that can be experimented upon and, most importantly, "used up." It is ironic that in our modern culture of disposable everything and "no deposit, no return" bottles, children's workbooks cannot be written in because they must be used over and over again.

The classroom setup must allow for the development of the skills to observe, to question, to explore, to be aware of problems, and to try possible solutions.

Mr. Brademas. I wonder, Mrs. Weisberg, if you would not mind if I were to interrupt you and we will just put the rest of your statement in as if read and that would enable us to ask you questions about some recommendations you may have. Will that be agreeable with you?

Mrs. Weisberg. Fine.

Mr. Brademas. Because Mr. Reid and I have both read through your statement.

(Remainder of statement of Mrs. Arlene Weisberg to be inserted at this point.)

STATEMENT OF MRS. ARLENE WEISBERG, BRONX TEACHER MASTER TEACHERS PROGRAM, WAVE HILL CENTER FOR ENVIRONMENTAL STUDIES

A child who has had the responsibility for planning or maintaining an aquarium in the classroom may be better equipped to understand the problem of water pollution in terms of his own experiences.

In order for the child to understand today's environmental problems, air pollution, water pollution, waste pollution, noise pollution, he must first understand the interrelationship of things, of himself and all of nature. Education must be presented not as a set of separate subjects but rather as an integrated approach to everyday living.

A small group of children want to keep a gerbil in the classroom. This activity involves building a cage, finding out when and what to feed him, his habits, etc. This one activity involves mathematical measurements, following instructions, reading, science, working with tools and money values. The classroom emphasis is not broken down into math, science, reading and arts and crafts but the integrated emphasis is upon how to solve the problem of housing a gerbil. The child who perceives a problem and works through to a solution learns to value himself and to value his place in the environment. Any degradation of the environment becomes a degradation of himself. We do not want to raise a generation of young people who think of themselves as separate entities, as apart and distinct from the environment and who think nothing of disposing of their litter along streets and public highways.

Many children in the inner-city are "turned-off" from school. One of the strongest arguments has been that school has no relevance to the outside world. The discovery method uses that which interests the child, that which is relevant to him, his immediate environment. In the process of exploring the immediate environment, the child begins to form judgments. Some things in the environment are undesirable. How can we improve the undesirable elements or prevent them from occurring in the future? The child who has been encouraged to experiment and fail and try something else, will have the courage and self-assurance to become a change agent in his environment.

Because of the forward-thinking of the administrators in District 1, especially Dr. Charles Shapp, the District Superintendent, and the directors at Wave Hill, we have been able to conduct teacher workshops and to try out our ideas in the classrooms. It has been most gratifying to visit the classrooms and see children enthusiasically involved with the problems of waste pollution in their school, to see groups of youngsters actively experimenting with the effects of air pollution and water pollution. However, our small efforts seem inadequate when the vastness and complexity of the environmental problem is considered.

Many teachers and administrators are extremely interested in any programs dealing with the environment. Wave Hill has been visited by principals, coordinators and teachers from all over the city and the eastern seaboard, who want to share in the results of our efforts. We are enthused about our successes and would like very much to branch out into other areas of the city, but we are unable to do so because of limited finances, personnel and physical facilities.

Our staff has organized field trips for classes to come to Wave Hill with their teachers and parent volunteers. We have twenty-eight acres of beautiful natural area to explore and enjoy. We have ten different areas of investigation prepared for the teachers, complete with motivational activities, guide sheets and follow-up suggestions. We have assembled the manipulative materials necessary for the investigations. Yet we must substantially limit the number of classes who can come because of inadequate toilet facilities, lunch facilities and personnel for supervision. It is frustrating to have to say no to interested teachers and eager children because we lack the money to utilize our facilities to their full potential. It is doubly frustrating because our program has been successful and inviting enough to arouse interest in other geographic areas.

Fortunately some curricula have already been tried and have proven successful although there is always room for improvement. The most immediate need is for the appropriation of funds, as soon as possible, to develop the curricula and to put them into effect as soon as possible in the classrooms.

Programs, like our own seeded by Foundations like Ford and Old Dominion, will die out before they are full grown without the necessary financial help from the Federal Government, so well provided for in this bill.

I am optimistic that our environmental problems can be solved if money is appropriated on the local level in all communities *right now* for teacher training and for materials. In this way, we will be using our greatest natural resource, our children, to assist in their own growing awareness of the problems we all face.

Teacher Workshops in Environmental Exploration

Mr. Brademas. One of the questions I would put to you is with respect to your comment that you have been able to conduct teacher workshops and to try out your ideas in the classrooms. When you say teacher workshops, did you mean workshops that are conducted at Wave Hill for teachers in other schools in the city or for your own teachers? In other words, whom are you serving and to what end? What happens at these workshops?

Mrs. Weisberg. At present we are serving 24 teachers in district 10 and about five teachers from district 12 in the Bronx.

They attend workshops through the spring once a week and there will be an intensive training program in July for four weeks which will be from 9:00 to 4:00, in the methods of exploration of the environment and using the materials of the environment for classroom study.

Mr. Reid. Could you elaborate on those methods a little?

Mrs. Weisberg. Well, I can give you some examples.

Mr. Reid. We had a gerbil in here, but I was thinking---

Mrs. Weisberg. We had the teachers experiment with actual materials, the kinds of things the children might find and bring into the classroom and explore all the possible potentials of these materials, such as shells, rocks, pendulums, plants, things of that sort.

Also we have taken our teachers out on the Wave Hill grounds to explore the possibilities of the kind of study you can do when you take a class outside.

We feel if we get the teacher through the process of doing these things, the teacher will be better able to communicate to the children the kinds of possibilities inherent in certain materials.

Mr. Brademas. There is no program supported by the state of New York, I take it, aimed directly at environmental education.

Mrs. Weisberg. Not as far as I know. We are besieged

by teachers and administrators from other districts who want us to handle and service their districts, but we are very limited as to funds and personnel.

Variety in Curriculum Materials

Mr. Brademas. Where do you get your materials, curriculum materials? Do you develop them yourselves?

Mrs. Weisberg. Yes, we do. We believe that much of the curriculum will come from the child himself, rather than going into the classroom with the prescribed curriculum. We get many of our clues from the children.

Our first job in the classroom is to provide many materials, many interesting and provocative materials, and from the kind of materials the children experiment with and pick up we can see where the children's interest lie and do our planning from there.

Mr. Brademas. Just two other quick questions. Do you get from the U.S. Office of Education any of the teaching materials that have been developed for use in the over 100 environmental programs that have been funded in schools across the country under title III of the Elementary and Secondary Education Act?

Mrs. Weisberg. From the Office of Education and Information. We have sent for materials that are available. We have sent for many materials and we maintain a sort of research center at Wave Hill and we may have materials from the Office of Education and Information.

Mr. Brademas. The reason I ask the question is the federal government does support programs not unlike what you do, and it might be helpful if it were possible for school systems across the country to take advantage and learn from what has been used elsewhere.

Mrs. Weisberg. Except that I find many of the materials on wildlife and conservation and fish hatcheries and stuff of that sort we are not able to use to a very great extent in the elementary schools.

The great need is for materials on the level of the elementary school child, something that makes him aware first of all of his immediate environment and then gives him the impetus to push out into exploring the larger environment.

I would like to take exception to one statement that was made a few moments ago.

The Ghetto Child and Environmental Education

Mr. Brademas. Yes, please.

Mrs. Weisberg. About the ghetto child. One of our large aims is to make the ghetto child a change agent within his own environment, not to wait for somebody from the outside to come in and say these things must be cleaned up or changed or wait until the ghetto child is able to remove himself from the ghetto environment, but rather to have him see the possibilities right now while he is in the elementary school and have him feel the power that he eventually can become a change agent in the ghetto environment.

Mr. Brademas. You feel—and this is my final question—Mrs. Weisberg, that what you are doing is something that has commanded the attention of teachers in other schools in the city? That is to say, you seem to be something of a magnet for others to come and find out what you are up to?

Mrs. Weisberg. There is a tremendous amount of interest in the city. All that is lacking is direction, funding, materials and personnel to get this thing going.

Mr. Brademas. That's all?

Mrs. Weisberg. That's all.

Mr. Brademas. Thank you very much, Mrs. Weisberg. This has been most helpful to us and I am delighted to see that you are pioneering in the field to which this bill is directed.

Introduction of Dr. Edward J. Ambry, Director, New Jersey State Council for Environmental Education

Our next witness is Dr. Edward J. Ambry, director of the New Jersey State Council for Environmental Education. Dr. Ambry, we are pleased to have you with us.

I would like to suggest, if you have no objection, that you might summarize some of the opening pages of your statement and then move ahead to give us some of your immediate concerns and recommendations, if that would be agreeable.

Dr. Ambry. Yes, sir. Since time does not permit the reading of my prepared testimony, I will attempt to present a digest. . . . I hope I am qualified to speak, having been in the field of outdoor education and environmental education since 1939 and having had a long history of what might be termed leadership in this field, only to regret . . . that educational leaders who have contributed long, dedicated careers to environmental education have somehow missed the mark.

We have failed to move the establishment. We have failed to even make a dent in the curriculum.

Then my statement points out Wave Hill and other experimental projects across the country, literally hundreds of school districts that have gone into the theory of environmental education and have curriculum materials of varying degrees of authenticity, and that somehow we have not been able to marshal enough forces and manpower to create from these some viable models.

What I have stated is that if we are to move into more federal funding, that we certainly not neglect looking at what we have already accomplished, and in one place I state that I hope we "don't invent the wheel again."

. . .

STATEMENT OF EDWARD J. AMBRY, PH.D., DIRECTOR NEW JERSEY STATE COUNCIL FOR ENVIRONMENTAL EDUCATION

First, I want to congratulate Congressmen Brademas, Scheuer, Reid and Hansen for introducing and supporting H.R. 14753 during the first session of the 91st Congress and for their sustained efforts during this series of hearings. I would like to extend these congratulations to Congressmen Vanik, Yatron, Rodino, Rosenthal, Dulski and Roe for joining with the aforementioned Congressmen in the introduction of an identical bill H.R. 15934 in the 2nd session of the 91st Congress. These bills will surely gain additional support. Secondly, I wish to express my personal appreciation for having been invited to testify before this Select Subcommittee on Education.

Thirty-one years ago, in 1939, while attending college, I accepted a summer camp counselor position at one of the camps

sponsored by *Life* Magazine. The late Dr. Lloyd B. Sharp, Executive Director of these camps, and probably the most noted proponent of a movement in education identified as "outdoor education," opened up the eyes of this city-bred, young, energetic, about-to-be educator. He, through his philosophy of education, has been a driving force for thousands of other educators across this nation and, indeed, around the world.

Outdoor Education

The most significant experiment and research in the field of "outdoor education," which has come to be known over the past ten or twelve years as "environmental education," was conducted by Dr. Sharp and the New York City Board of Education when several classes from Junior High School 118 in Manhattan and Public School 147 in Queens participated in a three week environmentally oriented experimental program at a camp in New Jersey in June 1947. The results of this experiment, published under the title, *Extending Education Through Camping*, showed, on almost every test administered to these youngsters and to a control group who remained in their city classroom during the same three weeks, that the camp group achieved a higher level. Incidentally, a recent publication, entitled *City to Country, Outdoor Education for New York City*, which recommends environmental and outdoor education programs for New York City school pupils, fails to mention the 1947 program to which I have just referred even though the research report on this experiment is used as a standard text in many college and university outdoor education courses throughout the country.

Since the 1930's hundreds of outdoor-conservation-environmental education programs have been developed in school systems in almost every state. During the past four years considerable emphasis on this type of educational program has been generated through Federal funds made available under the Elementary and Secondary Education Act of 1965 and its subsequent amendments. In May 1968 there were 110 environmental programs sponsored by local school systems supported by this act.

Why, you might ask, should I be presenting this historical information? I'll answer my own question by stating that much has been accomplished and there is ample evidence to support this opinion. And then, I hasten to add that the accomplishments are scattered, fragmented, unorganized, and almost in complete isolation from what many educators and others consider the major thrusts in education yesterday, today, and perhaps tomorrow. Somehow, those educational leaders who have contributed long, dedicated careers to environmental education have missed the mark. We have failed to move the establishment. We have failed to make a dent in the curriculum.

At this point in time, with enough solid experimentation behind us, with the environmental problems crashing down around us, with the country's already stressed air, land, and water resources, with our highly urbanized and industrial society, and with the very quality of man's life at stake there is no room for further groping, no room for failure in our attempts to provide meaningful, relevant environmental education to young people and adults in the United States. . . .

H.R. 14753 the "Environmental Quality Education Act" is certainly a step in the direction which is urgently needed. . . .

There are some immediate concerns I'd like to share with this Committee and others. They stack up something like this:

The Need for Dissemination and Coordination

1. The Act calls for curriculum development and dissemination. . . . In my opinion, this is needed. However, we really cannot wait for the enactment of this bill. What we need *right now* is a method of retrieving and collecting all the curriculum materials developed through the more than one hundred Title III environmental education projects which were and still are operating. . . . This need was pointed out in the August 1969 Citizen Advisory Commitee on Environmental Quality *Report to the President and to the President's Council on Environmental Quality*. I quote from page 13 of this report:

> For our youth in school, Title III of the Elementary and Secondary Education Act enabled the establishment of over one hundred environmental education centers; but no program was initiated to disseminate to the rest of the Nation's teachers the teaching methods and curriculum materials developed at these innovative centers. . . .

In addition to Title III curriculum materials there are other excellent materials which should be gathered and evaluated. For example: *People and Their Environment, A New Concept in Conservation Education*, was produced by the South Carolina Department of Education in cooperation with Dr. Matthew J. Brennan and Dr. Paul F. Brandwein of the Pinchot Institute for Conservation Studies; *Education for Survival, A Conservation Curriculum for Grades 1-3*, was developed by the Madison, New Jersey Public Schools in cooperation with the New Jersey Conservation Foundation; the Education Development Center, Cambridge, Massachusetts, has produced a social science oriented curriculum entitled *Man: A Course of Study*; and the Madison Township, N.J., school district has developed a K-6 course of study which emphasizes the areas of science, language arts, health and art.

I recommend that H.R. 14753 incorporate a provision for a central coordinating unit somewhere, to serve as a clearinghouse. In fact, I would go further and call for the establishment of such a clearinghouse from funds which might, even now, be available to the U.S. Commissioner of Education in the newly enacted Elementary and Secondary Education Act amendments which provide the Commissioner with 15% of the total appropriation to be used at his discretion, or from other funds available under Title III.

Evaluation of Environmental Curricula

2. Pilot Projects called for in the Act . . . might not be the same type funded through Title III ESEA. My concern is that we don't repeat the same process of funding almost identical projects. If we can achieve what has been suggested in (1) above, it would be logical then to fund projects to test the curriculum materials in a variety of selected situations throughout the country. This applies to elementary, secondary, adult, college and university, and community action curriculum materials.

3. Evaluation of the effectiveness of curriculums is indicated. . . . I recommend State Departments of Education be included as possible contract agents. My reason for requesting that this be spelled out is my concern about college and university involvement. As things stand now, it is difficult for higher education personnel to identify with environmental education—it is outside the main stream of the higher education hierarchy—it is outside of the accepted "reward system" for promotion and salary adjustment. Unless the college community recognizes the importance of the task required to erase environmental illiteracy at all levels it would appear to me that little help will be forthcoming from this section.

Suggestions on Priorities, Technical Assistance, and Funding

4. The grants and projects required to carry out all of the items indicated [in Section 3 of the Bill] will have to be placed in some order of priority. All are necessary. Perhaps assigning percentages of appropriations to each item will achieve this. . . .

6. . . . in the section defining application procedures and authority to make grants I agree with everything but suggest that . . . the State Departments of Education role be strengthened.

8. Technical assistance from other local, State, and Federal agencies will be a must if this Act is to achieve its objectives. It would strengthen this Act if each state was requested to establish a Technical Advisory Committee similar to President Nixon's Cabinet Committee on Environmental Quality or his Council on Environmental Quality.

In New Jersey a *Master Plan for Environmental Education* has been presented to the N.J. Commissioner on Education, Dr. Carl L. Marburger. It calls for the establishment of such a committee. Dr. Marburger is in the process of establishing a Technical Advisory Committee and is implementing the *Master Plan*. This plan includes a proposed Environmental Quality Education Act which we anticipate will be considered by the New Jersey legislature. . . .

9. I have a concern about funding. After witnessing the dropout of Title III projects after Federal support expired I would recommend that this Act include a plan for a graduated local or State support base over a five year funding period—graduated from 100% Federal support to an 80%, 60%, 40%, 20% Federal support base in each ensuing year.

A National Center on Environmental Education

10. Whenever this nation is faced with a crisis there has always emerged a national center charged with the responsibility of leading the nation through its critical period. I think we are in an environmental education crisis period and recommend this Act include a provision for establishing a National Center on Environmental Education as an independent agency or as a sub-division of the National Institute on Education which President Nixon recommended in his March 3, 1970 speech entitled, "American Education Message from the President." This Center should be staffed to:

(*a*) serve as a national clearinghouse;

(*b*) review and edit curriculum materials being developed throughout the country and prepare this for inclusion into the ERIC system;

(*c*) work with industry, labor, volunteer organizations, community action groups, government agencies, in opening up communications among all of these independent groups;

(*d*) produce teacher training films for national use;

(*e*) develop other multi-media materials—films, TV tapes, cassettes, displays, teaching kits, and suggest new technology for improved teaching in the field of environmental education;

(*f*) provide the U.S. Office of Education with a continuous assessment and planning unit regarding needs, trends and programs in this vital area;

(*g*) establish a dissemination capability including work with mass-media in the production of TV presentations, news stories, and, in general, improve communications;

(*h*) design and field test new programs utilizing a multi-disciplinary approach to environmental education;

(*i*) develop curriculum models for general adult audiences, community planners, public officials and members of the business and industrial community;

(*j*) refine present evaluation methods and instruments already available and develop new ones;

(*k*) provide teacher training in environmental education utilizing established outdoor laboratories and field-tested K-12 programs.

Such a Center could operate one or more regional curriculum laboratories and serve as the coordinating agency for all efforts in environmental education.

Again, let me express my appreciation to this committee for providing me the opportunity to testify in support of the "Environmental Quality Education Act". . . .

Strengthening the Role of the State Departments of Education

Mr. Brademas. Thank you very much, Dr. Ambry— . . . especially in respect to your specific recomendations. Do you have any comment on the locating of the specific authority for the bill in the office of the commissioner of education?

Dr. Ambry. Yes, in my testimony I say I agree with all of the statements except one. I am a little concerned that we are not strengthening . . . the local 50 state departments of education. It seems to me in the wording of the bill you call for the U.S. commissioner of education to receive proposals and then to inform the local state departments of education.

I would like to see some statements in the bill to allow the state departments of education a stronger role in determining what might be funded.

Mr. Brademas. Now by that you feel that the state departments of education should receive the applications from local school systems and pass on them?

Dr. Ambry. I think I might go that far, yes.

Mr. Brademas. That distresses me very much. How many Dr. Ambrys are there in the state departments of education in the United States?

Dr. Ambry. I think there are more now than there were two or three years ago.

Mr. Brademas. That's a safe statement.

Dr. Ambry. I am feeling more dependent on them recently since the title III shifted to the state level. I begin to see emerging in many of the states a little more concern, a little more input and a little more contact with what is going on.

In the past, under title III, several projects were funded without the state departments of education knowing they were coming into existence, only to the distress of finding out from a local school district or school board that it had submitted a proposal.

I would like to see some kind of plug-in at the state level.

Mr. Brademas. The reason I am dubious of your suggestion is because it goes of course far beyond the environmental education bill.

Would there were Carl Marburgers in every state department of education of the union. But that is not the way the world is, as I am sure you know, and I was one of those who was not only opposed but militantly opposed to giving control over title III projects to the states, although at the same time I was a strong supporter of increasing funds for title V of ESEA in order to make civilized state departments of education, most of which you can say for the record are pretty poorly planned.

At any rate I appreciate your suggestion which I think we ought to do to some degree, to strengthen the role of the state agencies in the field of environmental education.

I suppose it would be true to say, and on this you might comment, that very few states provide any substantial monies earmarked for environmental education.

Dr. Ambry. Yes; this is true and this is probably behind my suggestion. By building it early enough into the game, they may be forced to do this and in the master plan for New Jersey that I just submitted to you, we are calling for a $500,000 act to be passed by the legislature of New Jersey—it is also called the Environmental Quality Education Act in New Jersey—which would give the kinds of funds you are calling for.

Mr. Brademas. I would like to commend you and the governor of New Jersey on that kind of enterprise. I would like to see that replicated across the country.

The Importance of Follow-up to Teacher Training

What about teacher training? From your own position what do you think we can do? What do you think ought to be done in the way of training school teachers in this field?

Dr. Ambry. . . . [There could be] two or three words added to one section of the act where you are calling for workshops so there would be some support for followup consultancies and followup activities.

I have been in this game long enough to know, if you get a group of teachers together and you inject them with environmental education techniques and know-how and they then disappear off the scene to go into a workshop on drug abuse and another workshop the following week on sex education, all of these injections and techniques don't seem to have a lasting follow-through in working with teachers over a long period of time. I am not in favor of sponsoring short-term workshops.

Mr. Brademas. That's a very telling idea. Do you support adult community workshops and discussion centers to develop interest in the community?

Dr. Ambry. Yes; we are doing that in Jersey. In this way we get the necessary community involvement in the problems associated with environmental quality. We don't get any place without community support.

The Lack of Concern of the Colleges and Universities

Mr. Brademas. My last question concerns something you have touched on, cooperation of the school system and universities in the state, in helping them strengthen their capacity for offering environmental courses via teacher training or curriculum development. Does Princeton help the school systems of New Jersey or not?

Dr. Ambry. Well, you picked on the one that does. Princeton very definitely does. We have about 40 colleges in the state of New Jersey and very few of them know what we are talking about on environmental education. I have taken a dig at the colleges in my testimony. I am not digging at the kind of things that were said before, the kind of environmental science studies to develop an approach to the monumental problem we have. I think you will get university support here. But what I am saying, in the prepared testimony, is that for the average college professor, when we are talking about environmental education, talking about getting out and working with the youngsters and schools, the universities and colleges are simply not plugged into this area of concern.

First of all in college circles—and I have been in them for 20 years—there is a reward, a gradation system. It is linked to a specialty and it behooves you to stay in your specialty and it doesn't behoove you to get out into the community and work with educators and people.

So I am not sure, as you call in your bill for colleges and universities across the country to vie for this money, that you can count on their support.

Mr. Brademas. Thank you very much. Your testimony has been very helpful. Mr. Reid?

. . .

Schoolbuses Going in the Other Direction

Mr. Reid. What are the problems as you see them in the classroom with the teacher and the student—and they are somewhat different—in environmental education?

What are the difficulties? What are the special kinds of things that need to be done in order to motivate the student, if necessary, to get him involved, show him relevance and so on?

Dr. Ambry. I had a friend who said someday he will wake up and find all the schoolbuses going in the other direction and then we will have environmental education.

I don't think, as stated by Mrs. Weisberg, that this will work only in the classroom. I think you have to have activities outside the classroom. I don't rule out the use of mass media and television through which we can evolve some new techniques in the classroom also.

We are preparing a teaching unit on thermal pollution in New Jersey. We have flown by helicopter over some of the polluted metropolitan areas, we have prepared a film loop, and we have some video tapes. A teacher could, in five one and a quarter hour sessions by pretesting the youngsters on Monday and posttesting on Friday afternoon, use this unit to develop in these youngsters an understanding at fourth-grade level, of environmental thermal pollution. We hope to develop this unit for the eighth-grade level and the twelfth-grade level.

There are some teaching units that could be developed for all classroom levels but I think they would have to be tied into field trips such as Mr. DeLury and others have mentioned.

Mr. Reid. Thank you very much.

Mr. Brademas. I would like to say in my own judgment what you have been doing in the state of New Jersey is at least in part what I hope this bill would encourage and stimulate and make possible for other states and communities across the country to do. . . .

Dr. Ambry. Thank you.

[*The committee adjourned at 12:20 p.m. after hearing the testimony of the last two witnesses for the day, Joseph Monserrat, president of the Board of Education of New York City, and Neil Fabricant, general counsel for the Environmental Protection Administration.*]

DAY 9

House of Representatives, Select Subcommittee on Education
Washington, D.C.

April 15, 1970

The subcommittee returned to Washington for its ninth day of hearings. John W. Macy, Jr., president of the Corporation for Public Broadcasting, and Peter S. Hunt, head of a management consulting firm, testified during this session.

Macy described the many-faceted potential of public broadcasting as a vehicle for environmental education. He particularly emphasized the capacity of educational television for reaching broad segments of the population, and pointed out that radio, too, offers an important medium of wide appeal.

Public broadcasting is exceptionally suited to making an impact on what has been called the "implicit curriculum"—the whole system of values that the child picks up outside of school. "Sesame Street" is an outstanding example of an attempt to turn the "countereducative" qualities of the implicit curriculum into learning supportive of the school curriculum. Such programming also plays an important change agent role as it affects both the school curriculum and commercial broadcast programming.

Hunt commented on various managerial and structural components of the bill, pointing out that the design of the organization for implementing the bill would be critical in determining whether the goals were achieved. Hunt noted that environmental problems are extremely sensitive to time: the cost of solving them will increase exponentially over time as long as action is delayed. For some problems, a point of no return may be reached, after which no amount of expenditure will solve them. Thus, it is crucial that the organization permit "rapid, aggressive decision-making." To streamline the organization for such efficiency, Hunt suggested decreasing the size of the advisory committee, moving the administering agency to a location of "higher congressional visibility" under the president's Council on Environmental Quality, and attacking both *general public education and reform of the K-12 curriculum simultaneously. At the request of the subcommittee, Hunt had also prepared a budget proposal, which was entered in the record.*

The subcommittee met at 10 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Marty LaVor, minority legislative coordinator; Ronald L. Katz, assistant staff director; Maureen Orth, consultant; Arlene Horowitz, staff assistant; Toni Immerman, clerk.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act.

Introduction of John W. Macy, Jr., President, Corporation for Public Broadcasting

The first witness this morning is John W. Macy, Jr., president of the Corporation for Public Broadcasting Co., former chairman of the Civil Service Commission. I am very pleased to welcome Mr. Macy here today and look forward to your testimony.

Mr. Macy. Thank you very much, Mr. Chairman. I am honored to have the opportunity to testify before you in the company of so many others who are interested in this legislation. . . .

If I read your proposal correctly, you are not recommending that we simply keep on doing more of what we have been doing. As I understand your proposal, it is aimed at finding new ways of bringing the environment (what is around us), ecology (the way it all works), and man (who is the most disruptive factor in the ecologic/environmental picture) into personal, working focus.

In other words, this bill would foster new approaches to making ecology a part of every individual's awareness patterns. As a long-range goal, only this kind of altered human outlook will do.

The Role of Public Broadcasting

I am very much interested in the ways that public broadcasting can interact with your educational efforts to improve the quality of the environment.

The aims of this bill conform to the concerns expressed in a resolution passed by the National Association of Educational Broadcasters at their meeting of last November. This group represented all facets of the public broadcasting community, including station managers, educators, and program specialists. This resolution read—

> We are concerned primarily with the need for greater public awareness and commitment to resolving the important issues concerned with the natural environment and with the man-made conditions which jeopardize it. . . .

Let me review briefly the purposes of your bill, certainly not to refresh your memory, but to make clearer the optimistic assessment I have made of the role that I feel public broadcasting can play.

Your bill proposes to develop our understanding and hone our awareness of the environmental and ecological situation; to disseminate new materials and information for use throughout the nation; to provide for community education programs that bring adults into the environmental action picture on the plus side of the scales. . . .

The specific tasks involved can be summed up briefly by saying that we must (1) build an awareness of how we and our technology affect and are affected by our environment; (2) instill a concern for man's responsibility to re-establish balanced relationships among all forms of life within the closed earth system; and (3) develop the motivation and training that will enable us to acquire and spread the knowledge and skills that will help solve our environmental problems and prevent their recurrence.

In short, no matter from which angle of environmental abuse we attack it, our central problem is to create a citizenry with a clear understanding that man is an inseparable part of the ecologic system and that our continued existence is directly tied to that system's continued functioning.

This is an enormous mission. It is precisely the type of mission for which public broadcasting is uniquely suited.

The broad scope of educational effort we are talking about must take place at every level of the educational enterprise. Public television is geared to such an effort. We are peculiarly organized to reach the public with programs of a general nature, and to zero in on target audiences with specifics to catch and hold almost any particular interest sector.

There is opportunity to reach everyone on public broadcasting, from toddlers to senior citizens, and in addition, we have proven—with such singular successes as "Sesame Street" and "Mister Rogers' Neighborhood," that we can not only reach—but teach target audiences. And yet surely, if we are to effect a changed outlook—then this is just the direction we must take.

We are deeply involved in education from the pre-school level in the home, to classroom teaching in elementary, secondary and higher education institutions, to continuing education in the community at large. We reach people in all geographic areas and at every economic level. A recent survey taken by the Louis Harris organization indicates that about 24 million people watch public television each week. In addition, recent findings show that nearly six million children watch "Sesame Street" each day.

Direct Citizen Participation in Programming

Because of its public service objectives, the Corporation for Public Broadcasting has a strong commitment to giving the citizen a direct role in the programming and related activities of public broadcasting.

In June 1969, the Corporation formed an Advisory Committee of National Organizations to advise the corporation on present and potential programming, with special emphasis on determining subject priorities and opportunities for direct citizen participation in public affairs programming. The advisory committee now has 26 member organizations who meet regularly with me and the corporation staff to evaluate specific programming ideas. . . .

The corporation is committed to providing opportunities for the citizen to become an active, effective participant in the development of public broadcasting, and especially in producing programs on such vital issues as environmental improvement. The possibility of involvement under the Environmental Quality Education Act would advance this commitment through the extraordinary opportunity to explore the almost limitless potential of broadcast programs concerning environmental problems.

Other Capabilities of Public Broadcasting

Another highly complementary function of public broadcasting in the overall environmental education effort is its ability to produce programs about the environment on a continuing, rather than on a crisis-to-crisis basis. As we envision it now, we would investigate first on the

very broad level, and then focus on various aspects as they relate to air, water and land.

We would plan to show the situation as it exists today—urban and rural, east and west, affluent and deprived. We would attempt to discover how it got that way, and we would explore options for change—alternative futures, if you will. These would include that of letting the deterioration continue on its present course. These are the types of programs, generally speaking, that we feel would serve to further the three goals of EEE [environmental/ecological education].

We have noted that many witnesses before this subcommittee have stressed the importance of developing an interdisciplinary curriculum for environmental education. This is an approach which the public broadcasting community recognizes as essential if people are to be made truly aware of the interrelatedness of the ecological system. It is an approach we are already building into our programming.

Public television's coverage of Earth Day, April 22, is an example of what I mean. The Corporation for Public Broadcasting has provided National Educational Television with funds for its all-day broadcast devoted to Earth Day. Both live coverage and regular programs will focus on questions about the environment and the forces that threaten man and his environment.

NET's Earth Day plans are an excellent study in the flexibility of public broadcasting and its ability to handle "interrelatedness," not just as a subject matter but as a way of presenting a subject. NET will begin the day with live coverage of activities in the East. Participants will range from Senator Muskie and Ralph Nader to the cast of "Hair," which will be seen performing from a moving garbage truck. Viewers will move with us from the Declaration of Independence in Philadelphia to the Washington rally on the Mall, then to New York for a citizen march down Fifth Avenue and a scrubdown of 14th Street.

From 4 to 6 p.m., Earth Day will tie in with regular programming for children. "Sesame Street," "Mister Rogers' Neighborhood," and "What's New?" will all deal with ecological themes, demonstrating how the subject matter can take on the flavor of its audience's interests and capabilities.

I won't lengthen this testimony by recounting with you the remainder of our Earth Day coverage plans, but I urge you to be with us as much as possible throughout that day. If you join us, you will see special plays, live coverage of the San Joaquin Valley survival walk, a special edition of "Book Beat" focusing on "Since Silent Spring," among other features.

"Implicit Curriculum" on PTV

There remains one very important contribution that public broadcasting is peculiarly equipped to make in the field of environmental education. Educators have labeled as "implicit curriculum" that whole system of values that the child picks up outside of school—values that spring from a world of hard rock music, drama, dance, and film, things that really grab youngsters, things they feel they are expected to leave at the school door when they enter, and which are waiting there to claim their attention and commitment as they leave. Too often these values are completely at odds with what they are asked to accept in the classroom, so they simply turn off and tune out while they are in school.

This other world of values is sometimes referred to as countereducation. In public broadcasting, we do not think this state of affairs need continue to be so. We are planning to use these same media—dance, drama, films, and hard rock music—as classroom purveyors of the environmental condition. We intend to surprise the students by adopting their language and telling them that school isn't an intellectual desert, unrelated to their lives; school can be where it's at. Bring the environment home to the youngster first; the grammar can come later.

Our approach then has been to start immediate, active exploration of the broadcasting opportunities inherent in the emerging EEE goals of the Office of Education, developing programming for teacher training, manpower education, public affairs, and cultural programs—all in the furtherance of environmental quality.

We heartily support H.R. 14753 and we intend to continue our own efforts along the comprehensive lines set forth in your bill as we understand them.

Again, I thank you for allowing me to speak to this important question. I want to thank you for this trailblazing opporunity. I will be glad to answer any questions you may have.

Proposed Mass Media Programs for Environmental Education

Mr. Brademas. Thank you, Mr. Macy, for your valuable statement.

I have several questions to put to you. First, you will recall that in the bill we specifically authorized grants for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology, in large measure because we are aware of the kinds of contributions the Corporation for Public Broadcasting and educational television have generally already indicated they can make in helping educate the public in a wide variety of important areas.

Therefore, I wonder if you could tell us what kinds of institutional arrangements would be helpful for pursuing environmental education through using the media.

Mr. Macy. First, Mr. Chairman, let me say that I feel the language in section 3 (a) (5) of the bill does provide the necessary authority to involve the corporation and public broadcasting in environmental education.

Secondly, the institution approach which we have been pursuing has been modeled somewhat after our success story, "The Children's Television Workshop."

We are in the process of developing a model organization which would conduct the necessary research and testing and then supervise the development of broadcasting programs, not only in television but in radio as well. . . .

So it would be our expectation, assuming available resources from both public and private sources, that we would move in the direction of establishing such an institution which would have as its fundamental goals the

development of broadcasting of a general nature for a national audience, supplemented by local broadcasting oriented directly to environmental problems in a specific community.

I make this latter point because I have the conviction that citizen participation and involvement in programs of correction must be locally based and locally motivated. I believe each community is different and its set of problems are affected by the total environment of that community.

Because public broadcasting puts such a heavy emphasis and such an affirmative reflection on the local station, it would be our belief that we should endeavor to support local activities designed to meet the needs in the communities.

The second area of purpose would be to provide broadcasting curriculum materials in the ecological area, built on an expertise linear base. We haven't gone far enough to say yet what the school age group would be, and I don't think it is too important that we try to localize this at an age level or bracket.

Accompanying that program, obviously, there will be need for teacher training. We don't believe a great deal has been done yet in the use of the media for teacher training. We would hope that we could utilize the urgency in this field to embark upon some constructive work in the field for teacher training.

The third area or purpose would be manpower training. We share the conviction of many others that if we are truly to launch an attack on the improvement of the environment, it will necessitate new skills and the creation of new jobs which have not existed previously. Here, too, the media can be effective in the teaching of those skills, in the understanding and awareness of those jobs.

So this is the scope that we have in mind. It would be our objective to have such an enterprise financed jointly by public and private funds, just as the Children's Television Workshop is funded by the federal government through the Office of Education and by private entities, the Ford Foundation, the Carnegie Corporation and our own corporation.

Current Public Broadcasting Activities in Environmental Education

Mr. Brademas. I noted that . . . you referred to what you described as "implicit curriculum," which makes an impact on the learning of children. I wonder, having used that phrase, if you could tell us, first, if you do anything in the "Sesame Street" series in order to make a dent in the consciousness of the pre-school youngsters about the environmental problem; and, second, related to that question, I note that . . . you say that in public broadcasting you are planning to use the media as "classroom purveyors of the environmental condition." You say you are "planning." I wonder if there is anything you want to elaborate on that? In other words, I am trying to get at the extent to which you are already in the business of taking advantage of the implicit curriculum.

Mr. Macy. We believe we are already pursuing this, and in many ways this is reflected in "Sesame Street." "Sesame Street" beamed into the home is also, interestingly enough, being used in the classroom. It is a program which is based on very comprehensive and penetrating research to explore the existing idiom that attracts and holds the attention of young children. So there is animation and there is fast music and there is a quick treatment of subjects.

We feel that this has already demonstated a learning value in that the pre-school children who are watching this program in measurable terms with respect to learning numbers and letters have advanced at a much more rapid rate than those pre-schoolers who are not exposed to those programs.

With respect to the environment, as I indicated in my statement, on Earth Day, there will be a special treatment of the environment, not only in "Sesame Street," but in other children's programming as well. And the program people at the Children's Television Workshop, which produces "Sesame Street," feel that in many ways what they are doing every day is by way of environmental education, because they are endeavoring to create an awareness and a sense of values for the youngsters observing those programs in terms of the world around them, so that he doesn't grow up in isolation and that poverty is not his lifetime lot.

As far as injecting some of the implicit curriculum into classroom programming, that is already occurring in some of the programs that are developed for delivery by public broadcasting stations into the classroom. Where that is done, it has to be done in conjunction with the local school systems, because we have 22,000 in this country. There isn't a great deal of uniformity, and it depends a great deal on the attitude of the existing school system, upon the system and curriculum creators and the teachers themselves, as to how much of this can be done.

I feel this is very important. That in this environmental educational effort that those in education be brought along with it; that they see the opportunity to really provide some new meaning and I think some new color to teaching by relating it to the environmental situation.

I feel that in the institution I have described, we would try to find and try to create a home for creative educators, as well as others who can use the media creatively.

Mr. Brademas. I appreciate that, and I was especially glad, Mr. Macy, to see you tie in, and again in your statement talk about the need for new attitudes, the need for new materials and the need for new methods of teaching innovation. I think you have caught the central purpose of this bill.

. . .

Importance of Pre-school Education

Mr. Hansen. On the question of programs, such as "Sesame Street"—and I know you have covered this somewhat in response to the chairman's question—what environmental component do you anticipate incorporating into programs aimed primarily at the pre-school child?

I might say that a number of witnesses who have testified in these hearings have emphasized the importance of educational efforts as early as possible in the life of the child. So I think, the rather remarkable results that we have seen from "Sesame Street" suggests that more at-

tention might be given to these very young children in helping to develop the kinds of attitudes toward the world they live in.

Mr. Macy. That is very true. Some recent research has evidenced that a large part of the learning experience now occurs before the child goes to school. So the pre-school experience is tremendously important in determining the youngster's future capability, and since the pre-school child, regardless of his economic background, is now watching television 30 to 50 hours a week, that becomes his window on the world, that becomes his exposure to the environment.

As far as the components of presentation are concerned, the experience in "Sesame Street" is that it is desirable to give the youngsters knowledge of the elements in the world around him. These programs are particularly intended for the child of a disadvantaged background.

The research has shown that the youngsters in the ghetto or the rural poor live in a kind of environmental isolation, and they don't appreciate the elements that constitute their world, so that this is a means of using that window on the world to show them what exists.

I recall that in the very first program there was a very good, fast-moving treatment of milk and where the milk came from and the importance of it in a diet. There have been little episodes about the importance of avoiding litter, and the aspects of trash collection. There has been by subtle and educational approaches reference to air and water pollution and the need for purity.

All of this was done with also an eye for entertainment. This has been the great achievement; this has been a combination of education and entertainment.

. . .

Impact on Commercial Television

Mr. Hansen. To what extent may we expect some of the leadership that you have been furnishing in this area, some of the results of your pioneering efforts to be followed by commercial television? Can the objectives you have outlined be accomplished by commercial television?

Mr. Macy. Yes, I think already we are seeing the impact of "Sesame Street" on children's programming on the commercial networks. I pointed out yesterday in my appearance before the Commerce Subcommittee on Communications that all three networks have hired new vice presidents for children's programming since "Sesame Street" went on the air in November.

Chairman Burch of the FCC said he looked at the public broadcasting as setting a kind of standard for broadcasters that in many ways would be a more effective means for improving commercial programming than increased regulation.

Let me add, lest I be misunderstood, the commercial broadcasters have been very supportive of everything that we have been doing in public broadcasting.

Washington is full of fight promoters and people are trying to promote a fight between commercial and public broadcasting. It just doesn't exist. In fact, a great deal of our support has come from private networks, and I expect we would find ways of working with them in this whole environmental area.

Mr. Hansen. Yes, I am aware of the support that has come from private television. From what you tell us here, apparently any real success that we can demonstrate in educational television would be multiplied in terms of its total impact because of the likelihood that it may be picked up and incorporated in the content of the commercial television programming.

Mr. Macy. I feel that it will. I think this is an optimistic note, and I think in our society, where there is a variety of competing means for delivery, that this competition will be healthy in delivering a valued product to the viewer and the listener.

Mr. Hansen. Thank you very much for your statement.

Mr. Brademas. Mr. Macy, thank you very much, indeed, and we shall try to tune in as soon as possible on some of the programs you will be doing across the country next week.

Mr. Macy. Thank you again for your leadership in this field.

Introduction of Peter S. Hunt, Peter Hunt Associates Consulting Firm

Mr. Brademas. Our next witness is Mr. Peter S. Hunt. Mr. Hunt, we are glad to have you with us. Please proceed, sir.

Mr. Hunt. Thank you, Mr. Chairman and members of the subcommittee.

My name is Peter Hunt, and I run a small consulting firm that was formed some three years ago to focus on the problems of our physical environment. My personal background includes management consulting in the fields of systems analysis, planning, programming and budgeting, cost benefit analysis and some six years of marketing and finance in one of the country's largest corporations. I hold an MBA from Columbia and an undergraduate degree in the biological sciences.

Since my experience in education is limited to the role of student, I would like to focus the majority of my comments on the proposed managerial concepts and structure of this bill. In essence, the composition, dimensions, and operating procedures of the organization are expected to bring the purposes of this legislation to reality. Although it may sound self-serving, I am convinced that an inappropriately designed organization would needlessly frustrate the attainment of the bill's goals. In short, it would take longer and cost more than necessary to do the job. . . .

Management of the Program

I would . . . like to direct my comments to the mechanisms and proposed structure for implementing the intent of this bill. The problems we are attempting to correct are extremely sensitive to time. The costs of any specified result tend to increase exponentially over time and indeed may pass a point of no return where correction becomes impossible. We cannot bring back the passenger pigeon. It is extinct. We should not attempt to bring back Lake Erie since we could buy so much more with the required resources if we spent them on other lakes and rivers.

In light of this high sensitivity to the passage of time, the managing organization of this program should be designed for rapid aggressive decision-making. True, the probability of making mistakes with a fast-acting group is higher than with the slower moving traditional structures. But it is my intuitive feeling that the cost of these inevitable errors will be more than offset by the social and economic costs that will attend the deferred decisions of a slow and deliberate organization.

An advisory committee of 21 members is far too large to handle the duties of managing this program. To be effective within a workable time frame, policy decisions and grant approvals are going to have to be made on a day-to-day basis, without waiting for the approval of a chairman and 20 part-time peers.

In line with this, I recommend that all duties of the advisory committee be placed in a full-time team of three program directors; that in the selection of these directors, no preference be given to people with either scientific or educational backgrounds, but that the qualification be those of a general executive who has a personal conviction as to the importance of the job; further, that these directors be appointed for statutory, rotating three-year terms.

In addition, I suggest that the size of the advisory committee be reduced to ten people from a mix of unrelated fields and their functions be limited to reviewing performance of the program and advising the directors on a quarterly basis. At least four of these committee advisers should be under 35 years old.

The location and managerial level of the operating organization also seems inappropriate to the job. As outlined in the bill, they would be submerged well down in the bowels of the bureaucracy under the advisory committee, the commissioner of education, the secretary of HEW, the president, and remote from the Congress.

Concomitant with this subordinate level comes an increasingly larger burden of dampening paperwork justified by their multiple superiors, as a method of keeping the juniors under control. These checks and counterchecks of paperwork, in effect, are likely to put the operating group out of action by increasing their response time to requests for aid and frustrating applicants. The inevitable result of a drop in applications for grants would be to either step down the program for an apparent lack of interest, or internalize the actual educational work within the group which was designed to manage and promote the program.

To avoid these problems of internalization or paperwork kill, I suggest that the operation be taken out of the Office of Education and placed at a level of higher congressional visibility. Specifically, in the Office of the President allied to the new Council on Environmental Quality.

Further, I suggest that a report of its annual activities be appended to the environmental quality report required in title II of Public Law 91-190. This shift would, I believe, help increase the prominence of the organization and reinforce the seriousness of the problem with both the president and the Congress. It also occurs to me that the Council on Environmental Quality was instructed to utilize an interdisciplinary approach. How better to coordinate with the educational aspects than by having a responsible organization as a cohort.

Priority Ranking of Target Groups

My next point concerns the strategy of emphasis for the various audiences outlined in the bill. To me, the most critical group or educational segment is the general public, specifically the adult population that is currently outside the formal channels of education. To reach them is of prime importance: first, because their attitudes and decisions will dominate for the next 15 to 20 critical years; second, because without their support curriculum changes in the kindergarten-through-12 education system are impossible. You may be able to develop the best educational program possible, but it will not be installed at the local level unless the adult population themselves realize the need for such changes.

I recognize that this adult group is the most difficult group to reach, and are the most resistant to change. But this, coupled with their pivotal position, just makes it doubly important that they receive the dominant focus of effort during the first five years of the program. If this public educational program can be successfully mounted not only will there be spill-over benefits to the other segments of business leaders, government employees and so on, but these other groups will find, in the rising level of public knowledge and sensitivity, inducement to educate themselves.

Simultaneously, with the initiation of a public education program, I suggest that work be started on a curriculum change program for kindergarten through 12. The design, development, testing and evaluation of such a program will, I am informed, take a minimum of five years before it is ready to come out of the lab for dissemination. With this development being paralleled by a public education program, one would hope that the state and local school boards would be prepared to accept it when it is ready for implementation, some five years hence.

In conclusion, I would like to thank the subcommittee for both introducing this extremely important legislation and permitting me the opportunity of appearing before you. I would be happy to answer any question on either this statement or on either of my two previously submitted comments to this bill.

Mr. Brademas. Thank you very much, Mr. Hunt. That is a most valuable and concrete discussion of some of the principle issues represented by this legislation.

. . .

Is Curriculum Change Possible Before Adult Education Is Accomplished?

There is a point you make with which I have a little difficulty. You suggest, in terms of priorities in the bill, you would give more attention at the outset to adult education.

Yet, we have had other witnesses who have taken just the reverse position, and I suppose what we would try to do, in putting the bill together, is make an effort to do both, for it seems to me difficult to put all of your eggs into one basket. When you say without the support of the

adult community, curriculum changes in the kindergarten-through-12 education system are impossible, I am not sure that that is the case.

I suppose one might say if you have the strong opposition of the adult community, you would have trouble, but don't you believe it would be accurate to say that polls were taken around the country to determine whether or not adults would be willing to support "Sesame Street" or Headstart, or a wide variety of changes that have been made in the American curriculum, both in substance and in ways of teaching, if I am getting my point through?

Mr. Hunt. Well, in reference to "Sesame Street," this is just one vehicle of school education, and it is passive. In essence, it can be turned off if one wants to. Children see it voluntarily.

In the case of Headstart programs, these were directed at specific groups, not the general public and not the entire educational system. And I think in the case of Headstart programs, these were well accepted by the audience that they were addressed to. So I see a difference here, sir.

Mr. Brademas. I guess all I am saying is that if one takes the position that you have got to educate the adult community before you can really move ahead in the school system in any suggested way, it seems to me to be an oversimplification of the problem. I don't know that you would really quarrel with what I am saying, but I think you have got to move ahead on both fronts.

Mr. Hunt. I think another thing that is important is the lag time. If you start educating in kindergarten at all before those environment-oriented children reach a point of making decisions, you have 20 years. The lag time is there, and these are critical years.

Mr. Brademas. I thoroughly agree. I think I appreciate what you are saying.

. . .

A Proposal for Organization and Budget

I wonder, Mr. Hunt, if you could elaborate for us a little on your proposed budget, [see below] because as you are aware Mr. Hansen and I and the other sponsors of this bill have not written any dollar figures into the bill, partly because we wanted to hear from authorities in this field and develop some judgment as to what was needed.

[*The budget proposed by Mr. Hunt follows.*]

5-YEAR OPERATIONAL MANPOWER PLAN

	Year				
Element	1	2	3	4	5
Advisory board	7	10	10	10	10
Directors	3	3	3	3	3
Formal curriculum education	1	1	1	1	1
K-7	3	3	3	3	2
8-12	3	3	3	3	2
College grants	1	3	3	3	3
Public education	5	7	7	5	5
Special programs				1	1
Administrative support	5	5	5	5	5
Total professional	28	35	35	34	32
Secretarial	17	18	18	18	18
Grand total	45	53	53	52	50

5-year budget
(In thousands of dollars)

Element	1	2	3	4	5
Operations:					
Advisory board	7	10	10	10	10
Secretary	8	8	8	8	8
Directors	120	120	130	130	130
Staff	505	704	704	672	570
Secretary	128	136	136	136	136
Supplies and miscellaneous	60	80	90	90	90
Total[1]	829	1,058	1,078	1,046	944
GRANTS AND EXTERNAL EXPENSES					
Formal curriculum education:					
Kindergarten to 7th	680	1,180	1,180	890	2,090
8th to 12th	680	1,180	1,180	890	2,090
College grants[2]	100	450	500	700	700
Public education	3,000	7,000	9,000	12,000	15,000
Special programs				100	200
Consulting services	20	40	40	40	40
Total	4,480	9,850	11,900	14,620	20,120
Grand total	5,308	10,908	12,978	15,666	21,064

[1]Excludes space and utilities.
[2]Excludes capital grants.

Could you comment why you have taken and set forth these particular figures?

Mr. Hunt. Well, I started off . . . with the primary areas of emphasis from the standpoint of formal education curriculum, college curriculum education and the extra special programs that I don't feel are necessary at this point: educating community and business leaders. I feel that is an obligation they can pick up themselves.

Mr. Brademas. You feel that this is an obligation they can carry out for themselves?

Mr. Hunt. Yes, I do, and I feel if the public was educated enough they would find it in their best interests.

Mr. Brademas. I am not as enthusiastic as you are about that. I just don't see local business and industrial leaders clamoring all over themselves to educate themselves about these matters, and I would say the same about state and local officials.

The part I was getting at in this bill is to help make environmental education accessible to leaders of this kind at the community level. Otherwise how are they going to educate themselves unless they happen to turn on one of John Macy's television programs?

Mr. Hunt. Well, these are the spillover benefits I am talking about. If public television programs and environmental book societies are established, they would have the opportunity of joining those.

To get on with this, I have broken it down . . . into a number of subordinate tasks. For the development of the curriculum, there are six areas: urban, northeast, southeast, central, mountain, Pacific. Specific curriculums would be developed for each educational system that would relate to the students and would show them how to use their local environment as a field laboratory.

On the basis of that, I went through the manpower planning schedule from the standpoint of people involved, again placing the heaviest emphasis on formal curriculum

education and public education, as far as the number of professional staff members that would be involved.

Then, as you may note, it runs from 28 professionals to 32 over a five-year period. I am quite sure that more than that might be effectively used. I am not set on those figures. I would say, if anything, they described a minimum position.

In the budgetary area, I went through and costed it out on the basis, first of the amount of dollars that executives and professionals of this nature would be expected to spend on an annual basis, including the travel expenses. As I remember, the general professional would run at about $28,000 to $32,000 a year. That is what it would cost to keep them effective. Then I added what I felt was an adequate staffing of secretaries, and so forth, to back them up.

The grants and external expenses are over 90 percent of the five-year program.

I am very tenuous on the formal curriculum education. Dr. John Swazy and Eugene Ruth from Teachers College in New York worked out a budget for a curriculum change model, and this was used from K through 8 and 9 through 12. In total, I believe that digests about $6 million over the five-year period each, $12 million in total.

One place I am on thin ice is this public education budget. I didn't have the opportunity of going through detailed cost analysis, as far as what it costs to mount museum shows, how many should be run, what was the cost of televison program, and so forth. So, if anything, that is the weakest element, the $3, $7, $9, $12, and $15 million.

I scaled enough overtime to show I felt it should be a continuing effort, and as we learn more about environmental problems, it would require more money to educate the public as to the nature of those problems.

Mr. Brademas. That budget, I take it, reflects your earlier statement that you felt much more priority should be given to the public education than to the provision of courses through the school system?

Mr. Hunt. Correct, sir. On the other hand, as I stated in the testimony, it will take five years just to develop the curriculum material. In six or seven years, I would see the normal curriculum education becoming far more expensive as it went into dissemination. That is when it is really going to cost the dollars. It is unfortunately out of the timespan of this five-year budget.

Mr. Brademas. This is about $65 million over five years, if I calculate what you have come up with.

Mr. Hunt. Yes, sir.

Mr. Brademas. This is most helpful to us, and I just have one other question. How is it possible to put so much money into the public education by way of distinction with the elementary and secondary school system if you argue, in part, that you can't do more in the school system because you don't have the curricular materials?

Would you not run into that same problem so far as providing adult education programs is concerned?

Mr. Hunt. Well, I see the adult education programs as sort of a sequential pattern of events, at least sequential objectives. The first one is the problem of sensitizing the general public and letting them know that a problem does exist.

After that comes, in essence, the educational process, following that attitudinal changes, and after that some changes in the behavior. . . .

Use of a Variety of Educational Channels

Mr. Brademas. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman. We appreciate the thought you have obviously given to the matter of working out a detailed blueprint that would implement this legislation. It has been some of the most helpful information in this area that we have had during the course of the hearings.

My question relates to the role that you think the non-educational institution or organization might play in this effort. As I look at your proposal, much of the effort is being channeled through the formal educational system. I am a little unclear on the extent to which the public education function will be carried out by the regular educational institutions or by others.

I am thinking specifically of the local conservation groups who may have some particular knowledge and talent, and certainly the interest, that may be able to carry out some of the educational programs contemplated by this bill.

Mr. Hunt. Well, sir, from the standpoint of the public education market for the adult education that is outside the channels, there are a number of vehicles and media that can be used. We have not only the local conservation organization, you have museums, you have television, you have a suggestion that was made last week—a reading society, you have the store front museum, you have fairs that could move around. There are a number of vehicles that could be used, and I would certainly hope that the local conservation organizations would be involved in this or perhaps would sponsor some.

I think their participation is necessary. After all, there is a great inventory of knowledge and concern in those groups, and they should be included to every extent possible.

I would be distressed if the problem of the public education were the sensitizing vehicle. If we only chose one vehicle it would be a disastrous mistake.

There are people in this country who don't own television sets and might not have the basic educational background to understand the problems if they were on television.

So I think the strategy for public education is one of moving on as many grants as we can find which would include the conservation organizations. Certainly, if they were running short of funds and had a specific local problem they were working on, I think they should be eligible for grants of some sort.

I don't mean to imply I would like to exclude them in any way.

. . .

Mr. Brademas. . . . Your testimony has been very helpful, particularly because you obviously have taken a good deal of time and gone to a great deal of effort to put to-

gether a proposed budget, which no one else has done for us.

I know Mr. Hansen and I are most grateful to you.

. . .

[*The Chair next introduced John Lumley, assistant executive secretary for legislation and federal relations, National Education Association (NEA), who was accompanied by Donald Hawkins, director of Project Man's Environment of the NEA. Lumley proposed that the preparation of educational and informational materials dealing with environmental education be placed under the auspices of an autonomous, non-profit public institute or corporation—a National Center for Environmental Education. This, he suggested, could draw on both federal and private funds and would act as a rallying point for all the various agencies involved in improving environmental understanding.*]

Mr. Brademas. We are now adjourned.

(Whereupon, at 11:30 a.m. the subcommittee was adjourned, subject to call of the Chair.)

DAY 10

House of Representatives, Select Subcommittee on Education
Washington, D.C.

April 21, 1970

James E. Allen, Jr., commissioner of education, and two of his assistants in the U.S. Office of Education presented the Nixon administration's views of the bill during extensive testimony on the tenth day of the hearings. The debate between the subcommittee members and these administration representatives was dramatic and highly charged, underlining not only party differences but also the continuing tug-of-war between congressional and executive power in federal government.

Allen stated the administration's position that, though they were in complete accord with the aims of the bill, they did not need any "additional authority to carry out the purposes of H.R. 14753." Allen described in detail the many environmental education activities that the Office of Education (USOE) and the National Science Foundation were currently conducting under already existing grants of authority from Congress, such as the Elementary and Secondary Education Act's (ESEA) title III and the Higher Education Act's (HEA) title I.

Congressman Reid pointed out that the claim of "no need for additional authority" was a "rather traditional remark heard around here. . . . The fact is that everybody thinks they have the authority but nothing gets done. . . ."

Brademas and other subcommittee members criticized the administration for its rhetoric without action and questioned the adequacy of the present USOE capacities for handling the goals sought by the bill. He noted the inadequate scope of USOE's authority, its record of inadequate achievements, and its weaknesses in setting funding priorities. The intended scope of the bill, according to both Brademas and Reid, is much broader than current USOE programs allow. The bill provides for overall, coherent programming and planning, attempts to reach a wide variety of target groups, and calls for multiple approaches, including funding of private organizations outside formal educational institutions.

As for the ability of USOE to handle environmental education, based on the record of achievement of the current programs under which it is dealing with the area, Brademas made a scathing criticism of the "success" claimed for ESEA title III programs, as well as those conducted under HEA title I.

Finally, Congressman Meeds expressed dire concern over the administration's "redirection" of monies provided by Congress for one program into other programs.

Throughout, Commissioner Allen held to his position that the problem really is a budgetary one—a need for additional funds or reallocation of existing monies—rather than a matter of increasing authority. At the request of the subcommittee, he supplied "ball park" budget figures for the bill.

The subcommittee met at 10 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Meeds, Reid, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Maureen Orth, consultant; Toni Immerman, clerk; Arlene Horowitz, staff assistant; and Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order.

Introduction of Dr. James E. Allen, Jr., Commissioner of Education

We are very pleased to have as our first witness this morning Commissioner of Education, Assistant Secretary of Health, Education, and Welfare for Education, the Honorable Dr. James E. Allen, Jr. . . .

Commissioner Allen. Thank you, Mr. Chairman. . . .

I welcome this opportunity on the eve of Earth Day 1970 to discuss the interests and activities of the U.S. Office of Education in environmental and ecological education, and to give my strong support to the purposes of H.R. 14753. . . . [T]his administration is dedicated in full measure to saving and rehabilitating our fragile, threatened environment, on which our very survival depends.

The Office of Education has a special responsibility in this regard, for one of the keys to survival is education. I would like to tell the subcommittee something of our activities and plans.

Soon after I took office as commissioner of education, my attention was particularly drawn to the growing seriousness of the pollution problem by an excellent film produced by a group of our summer interns.

Entitled *Crisis in the Capital: When Will We Ever Learn?* . . . this film portrayed dramatically the serious pollution problems in the District of Columbia area. This film increased my concern about what our schools and colleges were doing to educate our young people and the public generally, to the tragedy of our deteriorating environment, and, more particularly, what the Office of Education was doing to encourage and promote efforts to educate for environmental improvement.

In order to have an answer to my question, I asked one of my young assistants, Mr. Logan Sallada, to chair a task force composed of staff members in the Office and to report to me on their findings. And I find that Mr. Sallada represents not only the Office, but also the young people across our country who are interested in this subject. It is they who have brought to our attention, probably more than any other group, the current situation and the need for doing something about it.

Current Office of Education Activities in Environmental Education

As you might expect, the task force found the Office was supporting through its various funds a variety of programs, ranging from the most elementary forms of traditional conservation education to exciting new efforts in life and earth sciences.

Their survey showed that a major source of authority which provided support in the area of environment was title III of the Elementary and Secondary Education Act. Under this title more than $4 million has been devoted to conservation and outdoor education projects, including approximately 100 environmental and outdoor education centers. As you know, federal funds under title III are provided only for a period of three years; therefore, I was pleased to learn that a recent check of a sample of projects initiated with title III funds indicated that about half will be continued with state and local funds.

Another source is title I of the Higher Education Act. The Office had supported over $330,000 in projects which could reasonably be identified as making a contribution to a better understanding of our environment under this authority. These included in fiscal year 1969, for example, grants to Bowdoin College to produce a film on community land use in Maine; to Boston Architectural Center for a study of environmental design in community planning; and to New Mexico State University for a citizens conference on water resources.

In addition to these programs, monies provided from other Office of Education programs, such as teacher training, manpower development, curriculum development, and graduate study have included projects related to environmental education. . . .

In February I sent a special message to chief state school officers suggesting specific activities for the encouragement of environmental education which they might undertake at the state and local levels, including the development of comprehensive state plans. . . . In response to these actions, we have received numerous letters, . . . telephone calls, and visits from educators and local administrators expressing strong support of our position and interest in participating in activities planned by the Office. I have been pleased to note how far some states—California, New Jersey, Pennsylvania, and South Carolina, for example—have gone on their own to develop state programs in environmental education.

Although we did not have much latitude with fiscal year 1970 funds, we have redirected monies wherever possible into projects in support of environmental education. The research training program initiated a new effort to design innovative training programs for educational researchers, developers, disseminators, and evaluators to work on high-priority educational programs. We have sent out requests for proposals which encourage the design and implementation of training programs in a number of substantive areas, including environmental education. We anticipate that a few such proposals will be funded in fiscal year 1970 and that others will be funded for operation in fiscal year 1971.

We are also negotiating with the Corporation for Public Broadcasting for the production of an important educational TV program in environmental education. Details of this project, into which we shall be putting over $2 million, will be announced soon.

We have set aside $200,000 of EPDA funds for the partial support of a number of teacher "teach-ins" this summer to be held around the country. These teach-ins will be designed to encourage schools and school systems to include environmental studies in their curriculums for grades K through 12. The short-term objective would be to partially integrate this into existing subjects or to establish new courses. Participants would include teachers, curriculum development specialists, administrators, and students. The Office of Education plans to support costs for planning, materials, and consultants. State departments of education, local school districts, and other groups would provide participant support costs. The Office of Education hopes to partially support approximately 40 local teach-ins and seven regional teach-ins.

We are sponsoring a major conference in August on the challenges of environmental/ecological education in the schools of America.

The Office of Education and the Department of the Interior, through its National Park Service, are entering into a cooperative agreement to make optimal use of the cultural and natural resources available through the Department of the Interior's national environmental education landmark program.

We are beginning now to plan for our participation in the 1972 United Nations International Environmental Year.

National Science Foundation Programs in Environmental Education

Turning outside the Department of Health, Education, and Welfare, I would point out the contributions the National Science Foundation is making to environmental education under its broad authority to support research and education in the sciences. The Foundation is currently financing a broad range of activities in environmental education. Furthermore, with a focus in its fiscal year 1971 budget on problem-oriented activities, environmental programs will receive additional emphasis.

I would like to include as a part of my testimony at this point an enumeration of some of the specific National Science Foundation programs in this field.

(The programs mentioned above follow:)

NSF Activities Which Support Environmental Education

NSF has for a number of years directly and specifically supported education in the environmental sciences. The activities supported have included all types of science education activities and all levels of the education spectrum. The import of these grants has been both to upgrade the knowledge of those individuals who are following careers in teaching about our environment and to improve the quality of the materials of instruction used.

At the pre-college level an increasing emphasis has been placed on the improvement of the competence of teachers in this important area. In FY 1970, summer institutes provided for updating and upgrading the subject-matter knowledge of approximately 1,850 secondary school teachers in subject matter specifically pertaining to environmental quality; for example, of the 58 grants awarded for study in the biological sciences, over one-third were specifically related to the study of environmental quality.

Similarly, in the in-service institute program and the cooperative college-school science program, there has been a steady increase over the past two to four years in projects which are concerned with environmental studies. These programs are focused on specific regions or localities and the instructional programs are by design relevant to the particular local setting and existing problems. The central theme of 12 in-service institutes to be conducted this fall will be "Man and the Environment".

Still on the pre-college level, but with broadened applicability, the Course Content Improvement Program has a number of active grants which pertain to environmental quality. Two examples can be cited: Environmental Studies for Urban Use (American Geological Institute) and Atmospheric Pollution Study Group (State University of New York at Albany). A number of proposals are now under consideration which will explore new approaches to giving facts about our environment and the development of an understanding of the importance of man's correcting past mishandling of his environment and planning for preservation and control of our natural heritage.

This approach also is found in a number of projects for superior secondary school students which involve research and independent summer study at colleges and universities which supplement the offerings generally available in high school science courses.

At the undergraduate level, institutes and short courses for college teachers, particularly in the subject matter fields of ecology and urban economics, provide instruction for college teachers primarily involved with the instruction of undergraduate science courses. The Undergraduate Research Participation program has for 12 years provided support for independent study and research for undergraduate majors in science. Grants in this program include studies of pesticides and their degradation in soil, phosphates, temperature-salinity tolerances, atmospheric polluton and estuarine processes.

An important outgrowth of the Undergraduate Research Participation program is the student initiated and managed research project which the Foundation has supported at the California Institute of Technology.

This project involved a number of students from several colleges and universities who designed and carried out a series of coordinated research projects on environmental problems. The success of this and similar efforts has resulted in a new program being established to support problem-oriented research training projects for students which will include particular attention to the impact of the social sciences in this area.

At the graduate level, support has ranged from the support of post-doctoral fellows and graduate fellowships and traineeships in study and research in the environmental sciences to special projects for advanced training in biological pest controls to seminars and field training to consider advanced ecological questions at the graduate and post-doctoral levels.

The Foundation, under its Public Understanding of Science program, has also supported projects to acquaint the public with the scientific aspects of problems associated with the preservation of environmental quality.

. . .

Commissioner Allen. Our current efforts, significant as they are, are but the start of what must be a prolonged and consistent drive to improve the world in which we live. I believe there is much more we need to do to stimulate and assist the education institutions in the nation to meet the challenge of educating for environmental quality and ecological balance. . . .

Appraisal of Office of Education Capabilities in Environmental Education without the Act

I am advised by my staff, Mr. Chairman, that we do not need additional authority to carry out the purposes of H.R. 14753.

The bill relies primarily on curriculum development as a tool for increasing public understanding, and understanding of the young people in our schools. Where additional curriculum development is required, we believe that existing authority is sufficient under the Cooperative Research Act, the EPDA, to fund any such projects and to disseminate curricular materials.

Additionally, we have broad authority under section 303 of the Vocational Education Act of 1963 to provide both dissemination of materials to communications media and technical assistance to state agencies, local educational agencies and institutions of higher education seeking to establish programs in this area.

Also, as I have indicated, other agencies of the federal government, such as Interior and the National Science Foundation, have authority to conduct environmental education programs.

I am nevertheless grateful for the leadership this subcommittee has taken by the introduction of H.R. 14753

and for the attention you are focusing on the urgent need to encourage increased educational activities with respect to understanding the current plight of our environment and the need to educate for environmental quality and ecological balance.

Mr. Chairman, I thank you for this opportunity, and I will be glad to answer any questions you may pose.

Lack of Support by the Nixon Administration

Mr. Brademas. Thank you very much, Mr. Secretary, for your statement. . . . [I have] no questions in my own mind of your own personal commitment to the idea, and of the need for federal support of environmental education, but I do have profound misgivings about the support given by the administration to efforts in this field.

. . .

I want to suggest it is a cause of great distress to me to see once again in the field of much needed education legislation, it appears all we are getting from the administration is rhetoric, high-sounding prose, but no action, and no flesh at all on the bones of the contention that "we mean business." They mean business all right. They mean business for the Bureau of the Budget, but no business for the urgent need of education.

Now, I think it is particularly distressing on the eve of Earth Day, that the officials of this government, who have primary responsibility for policy in education, should not find it possible to be able to come to this subcommittee and tell us after all of these wonderful speeches that this administration is indeed willing to give its support to a modest proposal, very modest proposal to provide support for environmental education—just to give us that.

To give you some idea, I think it ought to be on the public record, the lack of responsibility on the part of the administration in this field. Let me tell you some of the experiences we had in this subcommittee. I personally invited Russell Train, the distinguished member of the Department of the Interior, to testify on this bill, and he declined, although I should have thought that someone in that position might have had some passing interest of what we are up to in this respect. After he declined, he sent his White House fellow up here to be briefed on the bill, and the White House fellow left, stated he was enthusiastic about the bill, thought it was a good idea, and then the Department of the Interior called us.

We did not call them, and they asked to be scheduled to testify on this bill, and, indeed, the undersecretary was scheduled to testify, but at 4 o'clock yesterday afternoon, we received a phone call saying no one would testify, and no explanation was given: and yet I have before me, Mr. Secretary, a letter dated January 21, 1970, signed by the deputy assistant of the Department of the Interior stating he hoped the bill would be enacted soon.

. . .

Now, apparently the Budget Bureau had not gotten to this gentleman, and he found himself awash in the flows of Washington, D.C. . . . [I]t reminds me of the situation in which my good friend, also, Libby Coots found herself when she came up and testified in favor of the Brademas, Reid, Scheuer, Hansen education program, only to be advised later on, wait a minute, you are not supposed to be going up there and telling them, telling those fellows, that you are really for those bills. Even if you are, you have got to clear those things with the Budget Bureau, because obviously they know a lot more about education than you authorities and you in education.

I call also your attention to the fact that although your counselors tell you, to quote your statement, that "the bill relies primarily on curriculum development as a tool for increasing public understanding"—I don't know who your counselors are, Mr. Secretary, but they have not read this bill, because if you take a look at the bill, you will see that there is a series of measures that the bill contains of which curriculum development is but one.

Now I think we invited you to testify a couple of months ago, and there might have been opportunity during that period of time for somebody in your Office of Education to read the bill before coming up here and making a statement like that.

Inadequacies of ESEA Title III Programs

I also call your attention to a report of the Citizens Advisory Committee on Environmental Quality, chaired by Lawrence S. Rockefeller, whom as you know has been long established as a man with deep concern about the out-of-doors in particular; and I call your attention to the passage in that report dated August 1969 which I should have thought members of your staff would have brought to your attention on the subject of environmental education; and I think you will find that what the report of this distinguished advisory committee says about the state of title III of Elementary and Secondary Education Act, that it is completely out of line with what your testimony has said to us here today, and you note [in] your statement that a survey showed that major source of authority which provided support in the area of environment was title III of the Elementary and Secondary Education Act.

I don't think that is an accurate statement. If you will look at page 13 of the Rockefeller Report of August 1969, you will note, and I quote:

> With respect to Title III of ESEA, which they indicate enables the establishment of over one hundred environmental education centers, no program was initiated to disseminate to the rest of the nation's teachers, the teaching methods and curriculum materials developed at these centers.

They go on to point out in this document some profound reservations about leaning on title III, ESEA, a major source of authority for environmental education.

They say, and again I quote from the Rockefeller report:

> Today, after speaking of Title III programs, today, after nearly four years of experience, there is no source that can tell one what specifically has been produced in these Title III projects, what specific curriculum material or teaching techniques are worth preserving, no report on which environmental projects have been successful.

And why not?

They go on to warn that with respect to the act which Congress took to give title III responsibility, to take away

from the Office of Education, and to put it in the hands of the 50 states, that this also is going to compound the difficulty of using title III. They make similar complaints about the title I of the Higher Education Act, which is the continuing education program, noting that few programs under title I of Higher Education Act of 1965, have been designed for the needs of central city residents.

I could go on, Mr. Secretary, but I have hit you pretty hard, and I ought to give you an opportunity to respond to some of these concerns. . . .

Commissioner Allen. Well, I think, Mr. Chairman, that your comment about our statement that no additional authority is needed, and, therefore, this bill is not necessary in order to do something, is wrong, because whether we have this legislation or not, we are in a position and plan indeed to take advantage of the existing legislation. We have to move ahead in the environmental education field.

Our problem is a budgetary one, not lack of authority. Title III and other titles in the various legislation that we administer give us broad authority to encourage and stimulate the educational community in the country to devote their funds to environmental projects, and we intend to do so.

As a matter of fact, I will submit for the record a collection of the projects that are carried out under title III that are related to environmental education, and I think they will be an impressive one.

Mr. Brademas. Who made that judgment, that they are impressive, Mr. Secretary? We have been told precisely the opposite, that they are not at all impressive, and that they are being phased out. I have been told a little about the attitude toward their effectiveness. In other words, all of the experts tell us exactly the reverse. The experts on environmental education have not come in here singing the praises of title III projects.

Commissioner Allen. I think the significant point is that things are being done, and I hope as a result of our exhortations to the states that more will be done in this regard.

I would only emphasize again, that I intend, as the commissioner of education, to carry out the promises as I have indicated in these messages, to see to it that all of the resources that can be used to encourage and help the states and localities and institutions of higher education to revise their curriculums and center on environmental projects will be brought to bear, regardless of whether the authority is granted by this bill or not.

I think the fine thing that is expressed in this bill is an indication of the bipartisan support and strong support of the Congress in seeing to it that education does play its role in this regard, but I just reiterate it is our feeling that we have the authority within the existing legislation to move forward.

Is the Act Necessary?

Mr. Brademas. I am interested in the statement that you have the authority, because the analog we had with the administration with respect to the Drug Abuse Education Bill is of course quite telling.

I remember that the administration witness came up here, and he opposed the Drug Abuse Education Bill, which was designed to do in the drug field as this environmental bill is designed to do in this field. The administration witness said they did not want this bill, because they already had the authority to do these things, and we asked how much money they were putting into it.

Mr. Meeds. I think about $600,000.

Mr. Brademas. Well, we passed that bill over the objections of the administration, 294 to 0, which I hope sets a precedent for the environmental education bill.

Commissioner Allen. I might point out we have added some $3 million to our EPDA funds since this bill was considered.

Mr. Meeds. Will the Chairman yield.

Mr. Brademas. I yield.

Mr. Meeds. Your statement says, "Although we did not have much latitude with fiscal year 1970 funds, we have redirected monies wherever possible into projects in support of environmental education." I hope this does not set a precedent, or I hope what you do in the drug abuse educational field does not set a precedent of what you do in the environmental education field. Now, some of the programs which the Office of Education cut back were programs which I think were essential, so if you are going out and stealing more money from other programs to put in an environmental education program, it seems to me we have gotten nowhere.

Commissioner Allen. These matters of reading, drug abuse, all have very high priority, and it is a constant question of how you take the limited amount of money you have, to see to it that this money is spent to achieve the most good in these various priorities.

It is a difficult problem to get money out of a very tight budget, but I am saying to you that I don't intend to take money away from other important things if it will be harmful to those things; but there are always ways in which we can stimulate, through the research program and through other projects that we administer, increased attention to the educational process. I am promising to see that is done.

. . .

Mr. Brademas. I think it is a matter of choosing to put the money into these important programs, and the country will be a lot better off.

I have more questions, but Mr. Reid has to go to another meeting.

Mr. Reid. Thank you, Mr. Chairman, and Mr. Secretary, I want to welcome you here this morning, and to thank you for your thoughtful testimony. . . . I think the record should show that President Nixon has taken a very large and important initiative to focus national attention on reclaiming the environment. I am one of those who would like to see much greater resources put back of that commitment, but I think it would be unfair not to say that the administration has broken new ground, and it is in that spirit that I would like to have a brief colloquy.

Need for a Coordinated Federal Effort

First, though, Mr. Secretary, [in] the bill, the purposes

strike me as being somewhat broader than some of the initial testimony. . . . I think the thought in back of the bill is to develop a coherent effort at the federal level that will be supportive in regard to educational efforts across the board, not just elementary schools, but through adult education, and to deal with effective testing and dissemination of material that is relevant. I, too, have talked with Russell Train, who is doing an outstanding job in this area, but one of the things they have found is that there has been very little coherence, and he is just beginning with the statements from the departments to even identify responsibility of the different departments in this area, and the things they are doing concerning the environment.

Accordingly, I will ask you first, do we not need an overall coherent program in this area, because, so far as I know, no one is pulling all elements of the environment together as it relates to education, and further, as the Chairman has pointed out, so far as I know, there has been no pulling together with regard to title III of the efforts that we have. We have had testimony saying nothing as yet has been published, and it is plain that so far it has not been coordinated, and in some cases it has been only evaluated.

Commissioner Allen. Let me say that in the four or five paragraphs you read in the bill, the word "curriculum" or "courses of study" is in every one of them, so it certainly cannot be said that this is not a major or central part of this bill. While I recognize that the bill has a very broad approach, certainly the production of good materials, training teachers in the use of these materials, and evaluating these materials are a central part of the bill's approach. I do not believe that I could be wrong in saying that.

I would also say that I am sure it is the intention of the Environmental Quality Council to provide this coherent and coordinated program that we need from government in this area. I am sure it will be done, and I am sure that it is the intention of Mr. Train and the counsel to do so. He has called upon us in my office to play this role in respect to education, to coordinate the educational aspects on the environment, which we are planning to do. I think that the steps we are taking, and the plans already underway, are very consistent with the purposes of this bill.

Mr. Reid. Relative, Mr. Secretary, to title III, has anybody assessed that, evaluated it as to the work that has been done?

Commissioner Allen. This is now being done by our task force that I spoke of . . .

Mr. Reid. Mr. Secretary, I think that the bill is needed, and I think there is clear support from around the country, and there is a broad interest in it. In my judgment, a quiet talk with the White House, a little encouragement of the Bureau of the Budget would be helpful. It seems to me the bill is on all fours with the president's efforts to do something for the environment. Consistent with your leadership, this is a piece of legislation that will give you an overall planning authority in this area, and it would be extremely relevant. We would appreciate your submitting that report.

Let me state further, I do not believe the administration does not want to do a great deal, and to that extent, we should try to remove the budgetary roadblock. Philosophically, I cannot find very much difference between the approach of this bill, and what I believe and hope is the approach of the administration. Their assessment seems to be in accordance with this.

Commissioner Allen. Yes, and as I indicated, I recognize that this bill is a strong bipartisan expression of the Congress concerning an interest in seeing to it that the education system is, and that education programs are, focused in this area. I am sure that I speak for the administration, and certainly I speak for myself, in saying that I appreciate this approach to the backing that the Congress is providing.

All I am saying is that, based on the information I have and on the reviews we have made of existing legislation, we do not find any need for further authority to move ahead in this field. Frankly, if I find that we do need authority at any moment, I will insist that we come back to the Congress with an appropriate request.

Mr. Reid. Well, I appreciate the pertinence of that remark in the spirit that it is given, but I must also say it is a rather traditional remark heard around here from time to time in years past. The fact is that everybody thinks they have the authority but nothing much gets done, and given the way programs do seem to get launched, there is a need for this coherent bill, and major funding back of it, and agreement from the White House. I believe that it is necessary to do something in a major way, and I think it would be very useful to pursue this with your help, and I will endeavor to have a few quiet conversations.

The 1971 Environmental Education Budget

Mr. Meeds. I would like to apologize to the commissioner for my earlier outburst. As you can see, I am a little bit distressed in this area of funding, and I hope you will accept my apology. I was a little bit pointed.

I would like to ask what funds specifically have been earmarked in the fiscal year 1971 budget requests for environmental education, and under which acts specifically?

Commissioner Allen. Well, principally, it is a cooperative research program. We have asked for a new amount set aside in title III, which gives the commissioner of education a certain amount of money for that. Let me submit for the record a complete listing of these items.

I do not have them all here.

(The material mentioned above follows:)

EXTENSION OF REMARKS ON EARMARKING OF BUDGET FUNDS FOR ENVIRONMENTAL EDUCATION

As you undoubtedly know, the Fiscal Year 1971 budget was prepared before I assumed office as Commissioner. Thus, no funds were *specifically* tagged as "environmental education" in the budget.

I am attempting to use my authority wherever possible to encourage use of funds under existing discretionary programs for environmental education.

The Fiscal Year 1971 program budget is currently in the final stages of preparation and I am unable at this time to tell you exactly which authorities will provide funds for this purpose and in what amounts. I can say, however, that our current plans call for a *minimum* of $4,000,000.

In addition I might indicate at this time that I intend to ask for an additional $15,000,000 under existing authorities *specifically* for environmental education in the Fiscal Year 1972 budget.

Mr. Meeds. Let's direct our attention to the EPDA program which provides funds for teacher training, personnel training. Will you get a little more specific? Do any of you people there know if any specific funds are being earmarked for environmental education with EPDA in your budget request?

Mr. Alford. We have $200,000 requested for training purposes from EPDA funds.

Mr. Meeds. Is this over and above other funds requested in EPDA, are we going to get into the same thing we did with the drug abuse education thing, in not raising the total amount, so you take it from some other program, $200,000?

Mr. Alford. Of course, we have to await final action of the Congress on the 1971 appropriations; but to date, of course, with the House action, EPDA has received additional sums of money for 1971, so we would assume in these cases it could be over and above, but that is depending on the final outcome.

Mr. Meeds. But you see, Mr. Alford, Mr. Commissioner, I am not at this point asking what the Congress is doing. I am asking what the administration is suggesting.

Mr. Alford. We have requested more funds.

Mr. Meeds. Specifically had you asked for more funds on environmental education?

Commissioner Allen. No, not in the 1971 budget, but in the 1971 budget part of the additional funds we will receive will be devoted to environmental education.

Mr. Meeds. So we are all really getting back into the same type of thing, as we did with regard to the Drug Abuse Education Act, and which I complained of earlier.

We are going to set new priorities within the existing funds, and I will point out to you that for years we have been trying to get some funds for a vocational education program, which many of us think also is very important. I think for the first time this year the administration has asked for funds for that. What you are really telling me is you are going to take $200,000 from some other program, which the Congress also feels is important, and put it in this environmental education matter.

I am suggesting that what the administration ought to be doing is coming up here and supporting the bill, a bill. You do not have to support our bill, but with some affirmative suggestions on new emphases in the field of environmental education, ask for authority under which we could appropriate some funds. As with the drug abuse education matter, I am sure we can appropriate some additional funds for those programs, because they are high priority programs, and we have a national consensus now that they are national priority programs. It seems to me that the administration ought to be in a position of leadership here, and taking this national consensus and utilizing it to the end that Mr. Reid suggested. We should be placing new emphasis on this program, providing new funds for this program, so that we really can come out with an environmental education program, which does not have to, I will soften my word, borrow from some other program which is also important. I hope you will pardon me, but this sounds like a replay of the old record we had with regard to drug abuse education.

Will you submit for the record what specific requests are being made within the budget, or suggested budget of the administration for fiscal 1971 and 1972, if you have that, specifically for environmental education?

Commissioner Allen. We will in the 1971 budget. We are just beginning planning for 1972, of course.

Mr. Meeds. I am sure. I think that is all.

Mr. Brademas. Mr. Bell.

Should Environmental Education be a Budgetary Priority?

Mr. Bell. Thank you, Mr. Chairman. Welcome to the committee, Mr. Secretary. It is a pleasure to see you here. I want to say at the outset that I am not just sure what my final position will be on this bill, but at the present I tend to favor it.

It looks like a necessary bit of legislation. I am, however, sometimes amused by my good friends and colleagues on the other side of the aisle, who proceed to say very blandly that we must have these things, that this is very important legislation.

Yes, we are concerned about this. The budget is a very serious problem, but we need more money for agricultural programs, educational programs, poverty programs, foreign aid, and for drug abuse.

Saying this does not solve these problems. We have a budgetary problem, which I think the secretary very much recognizes. I think the secretary is for this bill, and I am not putting words in your mouth, but I think he is also concerned about the budget.

We have a financial problem. If you want to say, "Let's forget about the budget, let's spend more money for everything," that sounds very good, and you may get some votes. But I do not think it will solve the problems, and I believe we have to establish priorities, and perhaps this should be one.

I just wanted to say I think it is necessary to have more money, but I think we have to be responsible also. Thank you.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman. May I join my colleagues in extending a welcome to you? . . .

Present Scope of Authority of the Office of Education

I think it is safe to say that within this existing authority we are moving forward, and we are doing more than has been done in past years in this area. I just have one or two questions with respect to some of the broader purposes of the bill, to which Mr. Reid made reference.

The bill includes in its authority that of stimulating programs of environmental education outside the regular institutions. One of the main purposes of the bill is to try to encourage noneducational institutions, private organizations, to become involved in this educational process. As nearly as I can determine that authority does not exist under the specific acts to which you made reference in

your testimony, or does it?

Commissioner Allen. Something can be done through the cooperative education program, but if you mean by some agencies outside of the traditional education practice, education television, for example, we are taking steps, as I have indicated, to help through the cooperation of the Corporation for Public Broadcasting, and to develop programs for the public use, stimulating the public, helping to improve the environment in fighting pollution, and to give educational understanding of the problems that exist.

At least that is one illustration of what can be done outside, if you will. I do not agree that is necessarily outside, but it is one of the agencies other than regular school or college educational facilities.

Mr. Hansen. You think there is an important role that can be played by the noneducational institution, the private organization, in this area of environmental quality education?

Commissioner Allen. I do very much. As a matter of fact, I think one of the things we must bear in mind about education is that it is no longer something that is a 9:00 to 3:00, five day a week, ten months of the year enterprise. It must include all parts of our society. It seems to me that the private sector as well as the public need to consider ways in which they can be of help in this regard.

The business and labor groups, industry, the media, all segments of our society can join in attacking this problem. Under our own piece of legislation—title III, which I mentioned a while ago—this legislation encourages bringing into cooperation with the public school system, the noneducational organizations: museums, libraries, and other groups not usually thought of as a part of the school system. I think what the role of the school ought to be is that it ought to be heard. The role of the educator is to bring into play along with him these noneducational agencies, so that we will enlarge the potential for attacking this problem.

Mr. Hansen. I have one final question. Although you indicate for the most part the authority provided by this bill is not needed to move forward with many of the environmental educational programs, and that you are contemplating action being taken under title III and other titles, I do not see anything in your testimony or your responses that indicates there is anything in this bill that is inconsistent or in conflict with administration objectives in this area. Is that correct?

Commissioner Allen. No, I do not find any aspects of this bill in terms of its purposes, the kinds of programs that you suggest, that are inconsistent with what I want to do, and what I believe we can do.

Mr. Hansen. I will just make this final observation. I think in view of the strong support that has been developed thus far from a variety of forces across the country, and the great interest in the Congress in this legislation, it is fair to say it will pass, and as it does pass and is implemented, I am confident that we can count on the full coopertion of your office and of the administration in carrying out the objectives on which I think we do have very substantial agreement.

Commissioner Allen. You certainly can, yes, sir.

Mr. Hansen. Thank you again for your very helpful testimony.

Sources of Funds for New Programs

Mr. Brademas. Mr. Secretary, I have a few more questions to put to you, one of which has to do with my lines of questioning and the colloquy that you had with Mr. Meeds. . . . [H]e expressed his concern about the posture that the Office of Education has been taking with respect to meeting pressures for funding a variety of programs out of existing legislative authority, and I believe I am right in saying that this is the position you have taken with respect to the drug abuse field.

You have turned elsewhere to get the money for that, and some of us have been trying for some weeks now to define the mystery of where you are getting the money for your Right to Read program. We have had a hard time understanding that, and we have been told, I guess, that some of the resources for that will come from the additional funds for title III, and title II of ESEA, but the administration told us it did not want us to vote on it.

Now, not having voted on it, you are going to reach into that till and use the money from elsewhere for that, which is I think kind of a fascinating metaphysics, not to say politics; and what concerns me is that if you take the line that in response to every partisan effort in Congress to move ahead, to meet some urgent need in education—such as in preschool education, or right to read, or drug abuse, or environmental education—you are going to reach in and take money from some other program—like the Education Professional Development Act, or title I, or title III of ESEA, which were programs initially intended by Congress to be supported under those legislative authorities—you are going to keep dipping into that pot, and you are never going to have anything left for the programs that Congress intended be supported. That is, I take it that this is a problem of which you were unaware, is that correct?

Commissioner Allen. I am very much concerned about it. I can assure you I have not been one who has been shy about asking for adequate funds for the support of education. Anybody that knows the background of my career knows I have been pushing in that direction, but once the matter is settled as to what the budget is, then it is my reponsibility to try to see to it that the priorities that we have determined upon, and that the Congress has urged upon us, are financed as well as is possible, within the funds that are available, and we shall continue to do that.

It is not a question that all of these things are of great urgency, and will require looking into down the road for substantially more money. I indicated when I announced the reading goal last fall that this would be a year of planning. This was not the year when we would be putting a lot of big money into that project, because we need to develop plans on how to spend the money, and that has been going on; and I hope before long I shall be able to present to the administration a proposal for a more substantial support of that goal.

Budgetary Recommendations for the Act

Mr. Brademas. You have talked about money. Could you give us your judgment, having looked at the proposed bill, could you give us your judgment on what would be a reasonable amount of money? I am not now talking about the current fiscal problems, but what would be a reasonable amount of money to fund the programs contemplated under this bill, say over a five-year period?

Commissioner Allen. Well, I think I would like to consider that and send it to you, because that is a very big question, and one which will require more careful thought than I can give just at this point. Let me develop a ball park figure that might be useful to the committee.

Mr. Brademas. I would be glad if you would, because I have been privately advised one of the reasons the administration is unwilling to give support to this legislation is that the Budget Bureau thinks if we try to write this bill into law, that we will try to run away within the terms of the amount of money that we would want to authorize. That in all candor is not our intention. We are trying to write a sensible and sound bill, and I think it ought to be significant that we did not write any dollar figure into this bill because we did not want to come in with a prejudgment.

We have had one witness who has given us a proposed budget, which would be for the several programs contemplated in the bill, for over a five-year period, $5 million in the first year, about $11 million in the second, about $13 million in the next, and $15½ in the fourth, and in the fifth it would be $21 million, which would mean about $65 million over a period of five years. I do not think that can be regarded as a grandiose figure. I am not saying that is the one which I am wedded to, but this is a figure that has been suggested to us by someone who has done a great deal of thinking about this problem, and that would average out at about $13 million a year.

Commissioner Allen. Did he break it down how he would spend that?

Mr. Brademas. Mr. Secretary, I would be very pleased to make available to you this document, because it has been very carefully thought out by a very able person in this field, and it might be of some assistance to you. I would be interested also in getting your figures in regard to that matter.

Commissioner Allen. I will be most happy to send in a ball park figure to you.

(The figures referred to follow:)

Fiscal year:	
1971	$12,000,000
1972	15,000,000
1973	25,000,000
1974	35,000,000
1975	40,000,000

Task Force on Environmental Education

Mr. Brademas. Now, I would be interested also in Mr. Sallada, he is with you here today, and in getting some information about just what his task force on environmental/ecological education is planning to do, how much money you have in your budget for that particular shop. As I understand it, you are the director of the task force on the environmental/ecological education?

Mr. Sallada. I am chairman.

Mr. Brademas. How much of a staff do you have?

Mr. Sallada. We have a staff of about three people, directly, and then we have six to nine cooperative education students that work for us, and we have two full-time consultants who joined us three weeks ago.

Mr. Brademas. What kind of an annual budget do you have?

Mr. Sallada. Basically, as far as the budget, it is not a budget, for it is just salaries. There is no direct budget for that effort.

Mr. Brademas. So you really do not have a great deal of money.

The reason I raised this, is that once again, I referred to the report of the Citizens Advisory Committee chaired by Mr. Rockefeller, which indicated two years ago—and this is August 1969, that report—the committee recommended that an environmental unit be established in the Office of Education, and in response, an existing staff member was given the title of coordinator, and assigned an impressive list of responsibilities, however, lacking a supportive staff, the coordinator has been unable to fulfill these responsibilities.

I suggest to you with the kind of staff that you just outlined, and the growing interest in this field in the United States today, you are not able to do very much. You are going to be swamped.

Mr. Sallada. We are apparently swamped. I think one of the points that should be made for the record is that we are currently, through the efforts of the task force, assessing what the needs are as far as the staff is concerned in this area. At the same time we are trying not to create another bureaucratic unit within the Office of Education that sets itself off separately from other educational programs.

I think the commissioner's intent in setting up the task force was to review and assess the state of the programs in the Office of Education, and how those programs could be better utilized for the problems of environmental education. That is exactly what the task force is doing at this time.

The members of the task force were assigned from each of the bureaus to have direct liaison with the bureau chief, the associate commissioners, to serve at the pleasure of the commissioner, and to carry out that mandate, because, as you know, environmental education not only involves environmental research, it also involves the whole aspect of manpower training. All of these programs and the current legislation are now being reviewed and assessed for a report to the commissioner to be given to him on July 1. As for our direction in the future, we do not know at this time.

Mr. Brademas. In your estimate, you would say with respect to training, this involves the area of manpower training. I do not know if I would agree with that, because if we are talking, as this bill in large measure is addressed to, about the question of generating support for elementary and secondary grade school courses in environmental edu-

cation, we are talking about the training of elementary and secondary school teachers, who are not normally trained in this country under the Manpower Training Act, nor are they trained under the Vocational Training Act, and I have a hard time to believe that you people understand what we are talking about.

Mr. Sallada. I did not mean to imply the manpower effort is related to your bill, but rather it is one of the efforts, the manpower efforts, that we are looking at as a part of the task force.

Mr. Brademas. What kind of projects are presently funded by the Office of Education for teacher training at the elementary and secondary school level in environmental studies, if any?

Mr. Sallada. No, not currently.

Mr. Brademas. That again comes back to what Mr. Meeds was talking about to you about the Drug Abuse Education Bill.

You tell us you have all of this authority to do these things, but when we ask you what you are doing, the answer is nothing.

Mr. Sallada. Sir, I do not think that is quite fair. The task force was formed on February 9, and we are just beginning to form a plan as far as the Office of Education is concerned. We are not doing anything other than what I have described so far, and with regard to environmental education, nothing was done prior to this administration.

Mr. Brademas. I have no excuse for the prior administration, and I am glad to be just as critical of them, except the world is a different world in 1970 from what it was in 1969, and the impression that I have is that that message has not gotten through downtown. We keep getting the same old stale answers up here.

Title III Guidelines

What kind of guidelines do you plan to have to judge whether you want to fund the title III project in this field, considering also the fact that now you have to work through the states?

Mr. Sallada. As far as the guidelines for title III, again, all I can say is that we are waiting for an interim report of May 15, a final report of July 1, and we would hope in that effort, in the short range, we would come up and develop those guidelines.

We are currently at the stage of setting aside funds and planning for the evaluation of the title III programs. They are now collecting, and they have collected, most of the materials related to the title III programs, and they are setting aside funds. I was informed by Tom Burns and Commissioner White that the plans are to be announced, about the study of all the title III programs.

Mr. Brademas. Have you read the Rockefeller committee report?

Mr. Sallada. Yes; I have. I am aware of that section that you cited about the failure of the title III programs to give proper dissemination of those programs, and I think that is an inherent weakness in that title. As for the task force, we would agree with that statement.

Mr. Brademas. I was just wondering why you waited this long to be about it, in view that that report was published nine months or so ago. You now tell us that we can look forward to getting an interim report.

Mr. Sallada. Again, the task force was only formed on February 9. That came to our attention only within the last month.

Mr. Brademas. Let me ask you this question, which now gets more to the substance. You have been working in this ecological field for a time. What would you regard as the kind of considerations that ought to go into determining whether a title III or title I ESEA project should be approved for environmental studies? What are the objectives of that criteria that you would think ought to be built into any kind of environmental programs in the elementary and secondary school programs?

Mr. Sallada. I think it is critical that any effort we make in elementary and secondary education include the kinds of structures where students are able to benefit from an interdisciplinary approach in learning environmental education.

I think it is one of the great problems right now in education, with regard to the training that the students get, and the teacher efforts are becoming increasingly fragmented. I think the other opportunity that is required is one where we go beyond the concept of the four walls that the students are confined to, and they should have flexibility to be able to get out into the environment and see the interrelationships of the total environment in our ecological systems in order to understand it. I think that is critical. A third thing is related to understanding. It is very important that teachers be trained to enable them to impart this kind of education that combines the outdoors as well as the conventional type of education, one that has curriculum that stimulates the mind to see the inner relationships of our ecological systems, and the systems that we live in, the air and water, the functions of our body. It would be important that that kind of flexibility of education be involved, and this would be in title III and pre-school.

Mr. Brademas. Mr. Sallada, I think that is very helpful, and in my judgment you have done a splendid job in describing the purposes of the bill that we are considering.

State Activities in Environmental Education

Mr. Secretary, you said with respect to the environmental studies, one of your hopes, if I read you right, was to encourage the states to take a more active part in this respect in supporting environmental studies. Has any survey been made to show what the states are doing, and what we are now doing called environmental studies?

Commissioner Allen. Well, we requested that they begin immediately to develop plans and submit their plans to us to give us some kind of indication of what they are doing, and these plans are now coming in. . . .

I think that, at least from the reports that are coming in, virtually every state is beginning to turn its attention to this increasingly. New York state, for example, has set up its own special division or unit of environmental education.

I do not want to leave the impression here that the education community throughout this country is just sitting

waiting for somebody in Washington to tell them what to do. They are moving. They have the same kinds of concerns being expressed in the states and localities that are expressed here in Washington, and a lot of it is going on. We intend through our task force, Mr. Sallada's office, to keep abreast of the progress they are making, and the activities that are underway there, and we hope to disseminate the best of these practices.

There is not anything being done that is adequate, and will not be adequate in my judgment for some time until the country itself is awake to the fact that this must be a life and death matter. I believe the kind of steps that this committee is taking, the steps we are taking in the Office of Education and elsewhere in the administration and the government, will all help arouse the country to their duty in this regard, but it is going to take a lot of effort through all parts of our government, not merely at the national level.

. . .

Mr. Brademas. . . . Mr. Secretary, this is one point that I would like to make. You talk about the fact that all of the concern is not at the national level. That again is a standard response we hear, but I call to your attention the drug abuse bill again.

Now, it may be true that people across the country are concerned. I have no doubt about that, but it is also true that when you are listening to administration witnesses, such as have come before our subcommittee last year on the Drug Abuse Education Bill, and they were unable to tell us what the state departments of education were doing in regard to drug abuse education, because you had not bothered to take a survey of what they were doing, and we were all concerned about it. We also find in our state, Mr. Secretary, New York, that the laws are being violated in the state of New York, in that this is mandatory under New York state law for any public school that receives state aid to offer courses in drug abuse education; and we had clear testimony of this fact that this law, this mandate, is not being followed. So that while there may be concern across the country, and the states, that concern does not seem in many respects to be followed through.

You take the pre-school program. How many states did a thing about the pre-school education in this country, until the federal government passed Headstart? This is where some of the initiative of these program happily runs, and seems to come from, and here is where it seems the initiative for environmental education comes from.

They are not doing anything about this in the state of Indiana. I will tell you that. So I appreciate the point you make, but I will come back by way of concluding my own questions and comments to what you said, Mr. Secretary. To quote you, you said, "This is a life and death matter." That is what you just told us. If it is a life and death matter, I do not understand why the Nixon administration does not endorse this.

Commissioner Allen. I might say in connection with some of the programs adopted in the last few years in education, it is true the federal government took a lead, but I would say some of us from the states, I being one, were on the task force that promoted these programs. So, oftentimes the pressures do come back in the states to boost the federal government to take action.

Mr. Brademas. If every state had a chief officer like James Allen, I would be delighted. Well, you have been very kind to put up with our questions this morning, and we appreciate your coming to give your testimony very much. Your testimony is certainly very much appreciated by the committee.

Commissioner Allen. Thank you, Mr. Chairman.

Mr. Sallada. Thank you.

[*The next witness was John Osman, staff director of the urban policy conference program at the Brookings Institution. Mr. Osman described their conference program, in which Brookings brings together leading scientists in the environmental field and policy-makers from the public and private sectors. A major characteristic of these conferences, he said, is the use of mathematical models in forecasting and problem-solving.*

The final witness for the day was Adrian S. Fisher, dean of Georgetown University Law School and a representative of the Association of American Law Schools. Following Mr. Fisher's testimony, the subcommittee was adjourned at 12:30 p.m., subject to the call of the Chair.]

DAY 11

House of Representatives, Select Subcommittee on Education
New York, New York

April 24, 1970

The subcommittee convened for a second time in New York City for its first meeting following the Earth Day activities of April 22nd, 1970. Social responsibility and economic interests were the foci of discussion during the testimony of three witnesses—a university president, a representative of a major public utility, and a financial expert.

James Hester, president of New York University, was asked by the subcommittee what his institution was doing to support the eco-activism of its students. Of particular interest was the response of the university's financial policy-makers to student demands that investments reflect environmental quality priorities. Hester argued that a university's finance committee cannot act as a social policy committee, making moral judgments about "what is right and wrong in a society." The primary social value which must guide university investment policies is the production of income furthering education and research. New York State Senator Paterson, who sat in on the hearings during this session, suggested that it was unfair to ask individual institutions to make economic sacrifices for ideological reasons in our competitive system. It should be a matter of national policy, rather than individual responsibility, to curtail investment in socially and environmentally irresponsible economic ventures.

The social responsibilities of public power companies were the central focus of the subcommittee's debate over John T. Conway's testimony. Conway, representing the Consolidated Edison Company of New York, reminded the subcommittee that his company is legally bound to meet the power needs of nine million people. It is these people, not the power companies, who create the demands and resultant pollution. Thus, education of the general public is of prime importance in solving environmental problems. Congressman Scheuer questioned Conway sharply on the nature of the company's own attempts to "educate" the public through mass media advertising, asking why there were so many ads encouraging increased use of electrical appliances rather than reminding citizens of the environmental costs of using electrical power. Conway pointed out the great advantages of using electric power—greater efficiency in the use of human labor, improvement in the conditions of living, and greater opportunities for humans to live with dignity. He illustrated this by comparing workers in this country to those in some developing countries, where many laborers are still little more than "beasts of burden."

Joe G. Moore, a financial expert employed by Union Securities of Eastman Dillon, elaborated on the idea of "trade-offs." Moore opened his testimony with the statement, "Environmental utilization is primarily a choice between competing alternatives." He then discussed the problems of weighing, measuring, evaluating, and selecting from among various alternatives and their expected environmental results. He argued that economics can play an important role in an integrated approach to environmental problems because it possesses an important tool—cost-benefit analysis—for assigning values for the purpose of comparing alternatives. However, he also pointed out the dangers of relying completely on economic analysis in solving environmental problems.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 305, Federal Building, 25 Federal Plaza, New York City, N.Y., Hon. James H. Scheuer presiding.

Present: Representatives Scheuer and Reid.

Staff members present: Arlene Horowitz, majority staff assistant; Will Henderson, assistant minority clerk.

Mr. Scheuer. The Select Subcommittee on Education will come to order.

[*The committee began with a brief statement by the Honorable Robert Abrams, Bronx borough president, and then heard testimony from two students who helped plan Fordham University's Earth Day, Kevin McGrath and Rory Callahan. McGrath and Callahan expressed the sense of frustration and impotence on the part of young people in their attempts to influence the establishment on environmental matters.*]

Introduction of Dr. James Hester, President of New York University

Mr. Scheuer. . . . We are very happy to welcome this morning Dr. James Hester, the president of New York University.

. . .

[*Hester presented a prepared statement, in which he expressed New York University's commitment to environmental studies and described its efforts to support students active in this area. During questioning by the subcommittee he expanded on these topics, stressing the need for legislation to guide the people in changing their practices. The subcommittee questioned him in detail about the complexities of university investment policies and their relationship to environmental solutions.*]

Social Responsibilities and Investment Policies of the University

Dr. Hester. Our finance committee has not undertaken to act as a social policy committee. Its policy up to this time has been that its function is to provide maximum funds for the university and it has not undertaken to examine each of the companies it invests in from a social as well as an income-producing point of view.

This has not been its function.

Mr. Scheuer. Do you think this should be its function?

Dr. Hester. I don't know. I think if the universities are going to survive, they are going to have to be supported financially as effectively as possible.

If we are going to start diverting income for social reasons, then our education is going to suffer and this is a very complex quesiton as you know.

I am just reporting to you what the present policy of our finance committee is. It is charged under the law to receive gifts for the university and to invest them as productively as possible.

It is not charged under the law to exercise a social function in this area.

. . .

Their legal responsibility as I understand it—and I believe it is correct—is to invest the endowment of the university in such a way as to produce the economic support of the institution. They do not believe they have a right to exercise a social judgment on the part of the university about investments. Their social obligation is to support the university. If you start making moral judgments and you restrict income for educational purposes, you are exercising a judgment of what is right and wrong in a society rather than what is the most productive use of the endowment to support education.

Mr. Scheuer. We are making moral judgments every day of the week a thousand times a day.

Dr. Hester. But these men consider themselves to be experts in finance and they use that expertise just as they would for you, to try to produce maximum investment income from private investment. They do not decide to limit that function to support their particular social values. It might be inconsistent with what the students or the faculty believe. There is no consensus in the university that we will give up income in order to promote such and such a cause.

Mr. Scheuer. I am not asking the university, Mr. President, to give up income.

Dr. Hester. I am explaining to you what their philosophy is.

Mr. Scheuer. I am not suggesting that their philosophy ought to be that they sacrifice incomes in order to make a social input.

Dr. Hester. But as soon as you substitute any moral judgment for you economic judgment—

Mr. Scheuer. But these can be economic judgments. I think it is frequently true that, if corporations pay more attention to the community and societal results of their product, they will make more money.

Corporations are notoriously the worst judges of what is good for them anyway. Corporations throughout our history have been blind not only to the societal impact of what they are doing, but have been blind to their own profitmaking potential. Corporations as a group fought minimum wages. Banks as a group fought the Federal Deposit Insurance Corporation a decade or two ago. Now they are happy to pay money to advertise [it] on radio and television. They fought wages and hours.

The medical profession fought subsidy of public health. Now it takes them generally a decade or two to find out that what they fought was in the general interest of society and was within their own financial best interests, too.

I find that a very narrow view of—

Legislation vs. Economic Pressure for Social Responsibility

Senator [Basil A.] Paterson. Let me make one comment on that. I believe what we are asking of individual corporations or even in this case of an individual education institution is unreal. We are asking them to put themselves in the position of disregarding—and I will grant that you are right, in the long run it is in their own worst interests—but if we don't make it a competitively realistic approach they can't do it.

And what I am suggesting is for us to say to New York University, to their trustees, that you should invest in the kind of enterprises that are not going to further contribute to the demise of our environment, then we have to say no-

body can, not just them, but nobody else. And I believe that it is up to us as government to do that. If we say that it is a right of every citizen to be free from the environmental hazards that are being created, then we say to everybody, "You have no right to be contributing to the detrioration of our atmosphere," and that's the only way that the trustees of NYU or the trustees or the board of directors of any corporation are going to be able to compete.

. . .

Dr. Hester. I believe the corporations can adopt restraint and many of them are, but if you want effectively to control the polluting capacity of industry you have to impose it on a uniform basis so it affects them all alike—not so you don't unfairly penalize one company and not affect his competitor with restraint.

I am simply reporting to you, simply from the standpoint of investment policy, what they consider to be the facts.

This question is raised by students who would like to control the portfolio. The legal responsibility is in the hands of the trustees. The students would like to impose their social values on the portfolio.

The primary social value we serve is education and we wouldn't invest in an enterprise that was exploiting human beings in some illegal way. We obviously wouldn't invest in an enterprise that was deliberately engaging in segregation. But the standard they follow is that they can invest in any legal companies, legally engaged in business enterprise in the United States, with the maximum return, to support the highest possible salaries for faculty members, the best education for students.

Mr. Scheuer. I think that's extremely simplistic and a sanctimoninous and dishonest statement of the alternatives facing them. If you are a large investor in General Motors, it is not valid to say that, because you choose to vote your proxy to place on the General Motors board of directors a representative of the environmental interest, which is a public interest, it is not a good thing for General Motors.

. . .

Well, we are getting a little off the subject but I consider their mole's-eye view of their role to be a myopic one, an unresponsive one and a definite failure of leadership. Maybe at some point you and I could talk about the possibility of sitting down and chatting with them about a broader point of view on their role as investors of your fiduciary funds.

Dr. Hester. I would be delighted to.

Mr. Scheuer. And we are all impressed with the marvelous work of NYU, the great role it plays in the education of hundreds of thousands of New Yorkers, and none of us would want to do anything to diminish your funds to do your great work. . . .

Thank you very much for coming today. We were glad to have your testimony.

. . .

[*Following Dr. Hester's testimony, Congressman Scheuer introduced Senator Basil A. Paterson, Democratic designee for Lieutenant Governor of New York. Senator Paterson addressed himself to the special urgency felt by the people of New York with respect to the problems of environment. He countered the common criticism that environmental activism is a "cop-out," detracting from concern for racism, war, and poverty by saying such issues are inseparable from the problem of environmental deterioration. He suggested a constitutional amendment to include an "environmental bill of rights"—a guarantee that every citizen has an inalienable right to an unimpaired physical environment.*

The subcommittee next heard from Richard A. Madigan, executive director of the Wave Hill Center for Environmental Studies. Mr. Madigan summarized the activities of the center, including educational programs, teacher training programs, and the center's sponsorship of Earth Day in the Bronx. Mr. Madigan's testimony was followed by that of seven students from Stuyvesant High School in New York City: David Mageor, Evan Giller, Steve Nadel, Paul Geffner, Steven Bass, Peter Arno, and Mark Schweitzer. The students presented a "High School Ecology-Related Curriculum" they had prepared as a follow-up of Earth Day activities.

After hearing from the students, the subcommittee recessed for lunch and then reconvened for an afternoon session.]

Introduction of John T. Conway, Executive Assistant to Chairman of the Board, Consolidated Edison Company of New York, Inc.

Mr. Scheuer. We are very happy to have you here, Mr. John T. Conway, executive assistant to the chairman of the board of Consolidated Edison of New York.

Mr. Conway. Thank you, Mr. Chairman.

For the record I am John Conway, executive to the chairman of the board of Con Edison, and former executive director of the Joint Committee on Atomic Energy, and if it please the committee I request that my statement and attachment be introduced into the record as if read.

Mr. Scheuer. There being no objection, so ordered. It will be introduced in the record at this point.

Mr. Conway. Yes. I thank you.

(Mr. Conway's prepared statement follows:)

STATEMENT OF JOHN T. CONWAY, EXECUTIVE ASSISTANT TO CHAIRMAN OF THE BOARD, CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

. . .

On behalf of Con Edison, I wish to say that we are in favor of this bill and its objectives. We agree with the statement of Congressman Scheuer that "many of our environmental problems are the results of ignorance" and believe it is desirable that the United States Commissioner of Education be authorized to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological bonds, which is the stated purpose of H.R. 14753. . . .

As the electric utility company privileged to serve this area, Con Edison feels a heavy responsibility to meet the needs of the nine million persons residing within the 625 square mile area it services, at the lowest cost possible with a minimum impact on the environment. We are required by law to meet the demands for electricity placed upon us; demands which currently are growing at approximately 375,000 kilowatts per year.

Under present technology and technology foreseeable in the

future, there is no way of producing large amounts of electricity required by modern society without some effect on the environment. It is important, however, that the adverse effects be kept to a minimum and Con Edison is dedicated to that objective. However, the problem of pollution is not only a problem of electric generation any more than it is solely a problem of any specific industry. In the final analysis, it is an individual problem since each of us in one way or another causes pollution of one sort or another. It is imperative if we are to be successful in cleaning up our environment that every individual in his daily life conscientiously conducts his activities in such a way as to cause a minimum impairment to the environment. If proper environmental education is made available to all Americans beginning at the primary school level and continuing on through secondary and higher learning, a major step forward will be made in securing the necessary cooperation of all citizens.

Con Edison has undertaken a program to inform the public of environmental actions it has taken in helping to improve the environment in the New York City area. . . .

We recognize, however, that a much broader educational program is necessary covering not only the electric utility industry, but all industry and all individuals. This type of educational program with the objectives set forth in H.R. 14753 cannot be accomplished by industry alone, but must get down into the very fabric of our educational system.

If we are to successfully solve the ever-increasing pollution problem brought on by modern society, there is no question but that we must all have an increasing awareness of our environment and man's ability to live in that environment. There would appear to be no question but that we should begin at the primary school level and carry through into the universities, an educational program to help teach our youth how best to live on this earth. H.R. 14753 would be a major step in that direction. . . .

Mr. Conway. I would like to make some additional personal comments in support of your bill.

In connection with my present occupation and my former employment, I have had the opportunity on a number of occasions to visit universities and other schools around the country and I have been impressed by the interest of the students and their desire to take an active part in trying to improve their environment, and to understand their environment.

I am also impressed and somewhat disheartened by what I feel to be the ignorance I find among the students, and this even includes students in engineering schools, of the knowledge of ecology and some of the other sciences that go into the making up of the overall study of ecology. Therefore it would seem to me highly desirable that some attempt be made to help educate these students who are so interested and who do so desire to make a contribution in this field. . . .

I think there has been a tendency over the years to put federal money into more advanced fields of knowledge which benefit a very small segment of the student body. A bill like this, I think, would assist on a much broader base of helping to advance the educational qualifications of the students in our country. That's one additional reason I would like for this bill to pass.

Mr. Scheuer, I am prepared to respond to any questions you may have on the basis of that statement and the statement I submitted for the record.

Advertising by Power Companies

Mr. Scheuer. John, I appreciate your testimony very much. I want to state for the record that Mr. Conway for a number of years was executive director of the Joint Committee on Atomic Energy and, as such, he is a highly professional and highly skilled Capitol Hill hand. Therefore I take your words very, very seriously.

Mr. Conway. Thank you, sir.

Mr. Scheuer. And I appreciate your support, John.

Mr. Conway. Thank you, sir.

Mr. Scheuer. . . . I would like to ask you just one or two simple questions about the policy of utilities in general of stimulating demand for their product.

. . . [Y]ou say, very rightfully, under present technology and technology foreseeable in the future there is no way of producing large amounts of electricity required by modern society without some effect on the environment.

Mr. Conway. That's correct.

Mr. Scheuer. What you are saying is in effect what a number of us have been saying, that there is no known technology that we can produce electric power either by the fossil fuels or by atomic energy that doesn't have some negative environmental impact.

Mr. Conway. That's correct.

Mr. Scheuer. Now this being true, is it in the public interest for utilities as a group to engage in institutional advertising with taxpayers' dollars, since they are tax deductible, encouraging more use of electricity, encouraging the electric toothbrush, the hair drier and meatcutter and all nonessential gadgetries in which we are submerging ourselves?

Mr. Conway. Yes, let me answer as I see it, from the point of view of my company and how we handle advertisement.

Number one, we do advertise. We do not spend, however, more money on advertisement than we do on research, which in other sections of the country apparently is the case. An electric utility company, and I believe justifiably, can spend money on advertisement to the benefit of the consumer and I will give you the example of Con Edison.

Con Edison reaches its so-called peak—peak demand on its services—in the summertime somewhere between the hours of 3:00 and 4:30 in the late afternoon. Last year, for example, in the worst day we had in the summer, we had a demand put upon us which was the highest in the history of our company, in the neighborhood of 7.3 million kilowatts of power demand. By seven or eight o'clock that evening and into the night the demand fell off to less than one half of that.

We find that the demand upon us is growing at about 375,000 kilowatts per year. We must put in new capacity to meet that peakload. In some parts of the country they have a heavy industrial base—aluminum production, for example—which continues 24 hours a day. We do not have an industrial baseload in this area. Therefore we have a heavy investment in capital equipment to meet the peak demand which lasts only a few hours each day. When I talk about capital equipment, I talk about $200 to $300 million investment for a facility. That facility must be paid for during the life of it; it must be amortized. The consumer in the final analysis pays for the cost of that particular facility.

Advertising to Encourage Non-Peak Load Use of Power

Now if we can get our night load up a little closer to our peak, and if we can get our winter load up a little closer to our peak—try to even it out—then the unit cost of the power becomes less. Otherwise the electricity that's being used during that short period of time must carry the brunt, if you will, in paying for the whole plant.

We advertise electric heating, because that helps bring up our winter load. But we also believe that if the homes are not heated by electricity, they must be heated by something else. They have to be heated, for example, by oil.

Mr. Scheuer. A fossil fuel of some sort.

Mr. Conway. Some fossil fuel and, if you take individual burners per house, the actual amount of heat energy that's being obtained—the B.t.u. per pound of fuel burned—will be less than if you can do it all in a large efficient boiler. It is more efficient to do it in a single boiler. So we think we can justify going to electric heat insofar as the overall environmental impact on the area is concerned. We believe it is helping the problems of the environment.

Similiarly in lighting. We had an advertising program to "light a light, stop a thief." We entered into that advertising campaign on the request of the city. This was an idea that originated with the city and from all reports it did help in cutting down on crime. Again, this is off-peak load. As long as our peakloads are in the summer, you will not see our company advertising for air conditioning.

Now that is our answer—justification if you will—for advertising our product.

Mr. Scheuer. How can you urge the selective and pinpoint use of additional electricity to coincide to your off-peak hours? Aren't you simply encouraging the use of more electricity, sort of scattershot across the 24 hours, which in effect is going to require you to increase your plant, increase the environmental fallout?

Mr. Conway. If you listen to advertising specialists—and I am not one—and our sales force, they claim to be very effective in how they can pinpoint a particular pattern. To pinpoint, we give special rates on electric heating, to make it economically worthwhile for the individual party or individual consumer to purchase equipment to use electricity during a given period of time.

So that's one way you can offer electricity and pinpoint for getting off-peak loads.

Advertising to Discourage Over-Consumption of Electrical Power

I have been asked several times when I am out on the campus, "Shouldn't you be advertising for people to cut back on their use of power and telling people not to use air conditioning?" Well, by law electric utility companies are required to meet the demads put upon them and there's no question of the demand going up; we are doubling it nationally every ten years; somewhere, sometime we have to stop that geometric progression. Maybe the time is either here or getting close.

In answer, however, I think it would be the height of arrogance for a utility to tell consumers that they should not be using any more of their product, "that this is as much power as we are going to produce and we are going to stop at this level and you have to work out some way of apportioning its use." That decision I think has to be made by the citizens themselves, operating through the legislature, operating through the body politic. But it is something I don't believe should be put upon the utilities, because I think it would be arrogant for them to assume that responsibility.

Mr. Scheuer. You are sort of kicking a dead horse. I am not saying utilities should tell people not to buy electric toothbrushes, but they should cease and desist urging them to buy an electric toothbrush, and they might have sort of Smokey the Bear kind of advertising saying, "You know, additional electricity costs us in dollar terms and in social terms and think about it. Do you really need it?" Obviously you can't tell people you are not going to deliver the power. But it seems to me you are putting the worst possible face on it.

Mr. Conway. Right. I have been taking it to the extreme.

Mr. Scheuer. *Reductio ad absurdum.*

Mr. Conway. Yes.

Mr. Scheuer. How about some institutional advertising telling people what you say . . . , that there is no foreseeable technology where electricity will not produce negative environmental fallout and just saying, "Go easy."

The liquor companies say it. They say, "If you drive, don't drink; if you drink, don't drive." And they are saying to people, in effect, under certain conditions desist from using our product.

Mr. Conway. Right. I have two comments. Con Edison does not participate in institutional advertising since Charles Luce took over.

Mr. Scheuer. Right. It could even be humorous, like, "Look what this is going to do to us. Stop, look, and listen."

Mr. Conway. Mr. Congressman, there are some in the company who have advocated a policy along this line. In my mind, for example, I question the use of electric windows in a car. It is easier for me to turn a handle around. It is much more efficient for me [indicating].

Mr. Scheuer. Now wait a minute, John. Off the record.

(Discussion off the record.)

Electric Toothbrushes and Other Things

Mr. Scheuer. Could you list some of the items you would consider sort of nonessential in the larger uses of electricity?

Mr. Conway. In my own mind the electric toothbrush—which I don't use personally, but my dentist tells me I ought to use them—but I would prefer in this New York area there would be a cutback in the use of air conditioning in the summertime.

However, I find it very difficult to go out and tell somebody who has to stay in this city during the summer and can't go up to the Catskills or Adirondacks, or anywhere else, that he can't have this type of comfort. I would like to see less use of it in the summer because that's when we have our problems in our particular area.

But in the case of, as I say, electric heating or lights,

we feel we can justify it. I find that lighting by electricity, for example, helps the students in their reading. We are warned constantly by doctors and eye experts that students should have better lighting when they are reading.

Mr. Scheuer. We are all agreed on that. But how about the nonessential uses, the electric hairbrush or the electric meatcutter?

Mr. Conway. No, I would not think that's an essential use. I don't have it in my house. On the other hand, it is argued by those who are advocating the use of this, usually they are the manufacturers of a particular product, that it is essential for the housewife.

If you took the incremental additional use of electricity that these would cause, it would be fairly *de minimus.* However, the use of electricity has been going up at fairly rapid rate, much faster than population.

Mr. Scheuer. What's the component? Is it industrial, homes, air conditioning?

Mr. Conway. In our particular area here it's air conditioning, basically.

Mr. Scheuer. Business or homes?

Mr. Conway. Both. When doing some studies after Charles Luce became chairman of Con Ed, we went back ten years to see what were the projections of this company for 1969. Surprisingly for this last summer, if you go back ten years ago they were projecting it quite accurately. That was the projected growth.

We have now projected for the next ten years. We have laid out a plan now; we hope to meet that projection. We have disseminated it to the public service commission, the governor, and the mayor. We say we foresee this as being the demand on us the next ten years providing nothing interferes to stop the orderly progression of the use of electricity in the New York area.

We also set forth how we plan to meet this growth. For example, in New York City, the amount of new office space in the next four or five years that is either under construction or committed will require the equivalent of slightly over one million kilowatts of additional electricity. That's the equivalent of one new, large-size nuclear power plant, just to meet the increased demands by new offices going into New York City. That's a significant increase.

Yet our rate of increase is not going up in the 630-odd square miles we serve as fast as in other parts of the country.

Puerto Rico, for example, is doubling every five years; when you talk with the people in Puerto Rico who have the responsibility of meeting that increase demand it is a tremendous problem they have of trying to find new sites and build new facilities.

The normal construction of a new fossil plant, we figure will take five years from the time we decide to go ahead until it comes into operation. Nuclear plants run about seven years to construct. Our new pump storage at Cornwall plant is taking us more than ten years.

When you add the regulatory reviews, you have to plan far in advance. As I say, I don't envy the authority in Puerto Rico that has that responsibility.

National Zoning

Mr. Scheuer. If you had total power over decision-making, what national powers would you advocate, at least to slow down the rate of increase, policies that would be consistent with our democratic way of life?

Mr. Conway. That's a tough one and I can't know whether I could come up with a solution—

Mr. Scheuer. Education policies and regulatory policies.

Mr. Conway. Yes. The point is, I say I wouldn't be able to come up with a solution I believe that would meet or receive the acceptance of everyone.

I think there is no question in the matter that we have got to find solutions starting in the regional areas first, because I think it's easier to work on that basis. But I think in a final analysis we will have to come to a national basis for making decisions. How we wish to grow in those areas, what type of power facilities we are going to place and where we are going to place them.

It means setting up a regulatory procedure in which we have to put in one body the capability of analyzing the pros and cons as to one form of fuel versus another, one site versus another and—

Mr. Scheuer. One form of energy, don't you mean, versus another rather than fuel?

Mr. Conway. Right. I have to get energy, and from energy I have to decide how I'm going to get that energy and which fuel to use.

We are going to have to decide as to our streams, which streams, which rivers we want to save for recreation, for fishing, for what kind of fishing, for commerce; we have to be selective on this because we cannot use all of our facilities, all of our assets for every purpose.

We do this constantly on a zoning basis in the cities. In the cities as they get more crowded we start zoning and then the counties begin to zone. We are at the point in the national area and no question, we are moving into the interational area. We have to do what the large cities and small cities do—zone, not only in the use of land but also in the use of fuels and the use of energy.

Reservations About Discouraging Increased Power Consumption

Mr. Scheuer. Are there any national policies, either educational policies or regulatory policies, that would dampen somewhat the increase in the rate at which we are consuming power?

Mr. Conway. Well, let me say this. It concerns and I think it should concern us, the demands upon the use of electric power.

I see on the other hand some of the things that go with the inability to have power and problems inherent in lack of electricity. For example, in parts of India, in parts of Pakistan and even some of the remote areas of Russia—I spent three weeks in the remote Siberian areas of Russia—

Mr. Scheuer. When did you do that, John?

Mr. Conway. I did this about a year and half ago when there were some hearings in Novosibirsk on fusion; they had scientists from all over the world and Dr. Gerard Tape headed up the U.S. delegation and invited me to accompany him—at the time I was still on the Joint Committee. When you see in some of these remote areas the problems they have of not having enough energy and the

effect on the people who have to work—I have seen in India when they were building the Tarapur nuclear reactor women were making the equivalent of one and two cents a day carrying rock on their head to move rock out of the area. You see these people [who are] hardly more than beasts of burden.

Mr. Scheuer. You seem, John, again to have a real talent for going with unerring instinct to *reductio ad absurdum*. We have the Women's Liberation Movement in this country that would prevent that kind of limitation to electric power.

Mr. Conway. Recently, I was at Columbia Law School debating this question with some conservationists. We were in a beautiful room like this, well lighted, air conditioned, with no windows. Years ago it was different. We went during the summer, to try to make up time after World War II in the old Columbia Law building.

Mr. Scheuer. You find they didn't have an elevator.

Mr. Conway. That didn't bother me, because I was in better shape then than I am now but the windows had to be left open because of the hot, heavy August days of New York and we had no air conditioning. The dirt and noise came in.

Which would I prefer? No question which is more pleasant for a student. Is it essential to study with air conditioning and in a quiet well lit building at Columbia Law School? Maybe some of us would have been better lawyers if we had the same. I don't know.

But I personally do not believe we are at that stage in the U.S. today where we have to stop additional uses of electricity, because I still believe and I say this without having the available facts, that the alternatives are less desirable.

Now we are getting, we have to get to the point where we can't keep doubling our electric production every ten years. FPC chairman John Nassikas, in his testimony in Congress, stated we are going to have to build an additional one billion kilowatts installed capacity by 1990. We will have power plants all over the place and no place for you and me to stand if the United States continues indefinitely to double its demand every ten years.

We have to level off at some place. What that point is I don't know. I don't think we are at it in this country as yet. We may be coming very close.

How to Diminish Power Consumption

Mr. Scheuer. Well, I am simply asking you and I don't want to press it if I can't get an answer. Are there any national policies you can think of, either legislative or education policies for consumer action, different consumer patterns that would dampen or diminish somewhat the rate at which we are increasing our consumption of electric power?

Mr. Conway. Yes, sir. I think there are ways of having the same results by getting more energy per unit, of B.t.u., of fuel consumed. In a single apartment building, for example, instead of each and every one of us having our own individual unit, it is more efficient to have a central air-conditioning unit, to have controls in each apartment, to educate people to turn it off when it is not being used, to try to use the power of electricity only when you need it.

Personally I was brought up at a time when, as a boy, when I left the room I turned the lights off. If I didn't, my father used to say, "Are you working for the electric company?"

But we have to teach people to do that, not to waste electricity, because every time we leave lights on when we are not using them really we are wasting a national asset. We are wasting the fuel that produced the electricity, whether it is coal, oil, or nuclear.

Mr. Scheuer. And polluting the environment.

Mr. Conway. And polluting the environment. Don't waste energy.

Mr. Scheuer. Right. I understand Lyndon Johnson used to turn off the light bulbs in the White House to enhance the environment.

Mr. Conway. Right.

Mr. Scheuer. Is there anything else you can think of in terms of a national policy?

Mr. Conway. I think your bill here is helpful along that line. I think your bill would improve the educational level by teaching people at the primary and secondary level and carrying on through to adulthood about their environment and how to improve their environment.

From the point of view of the electric utility company this would be highly desirable, for the youth and the public to understand how power is produced. With a better understanding it is going to be easier for us to meet the demands put upon us and, if we find a place or site for a plant, they will better understand what alternatives we have.

So I think a bill like you have sponsored here would be highly desirable along that line.

Mr. Scheuer. John, let me ask you two questions. The first one is impossible, the second one may be possible. How do you teach teenagers to turn off the light?

Mr. Conway. You have to stay on them constantly and be right behind them. Usually you turn it off for them.

Mr. Scheuer. I have two teenagers and subteenagers and they look at me like I am creepy: "You don't have to turn off the light in Metropolitan Washington."

Mr. Conway. I have that with the telephone. I tell them, "You don't have to be constantly using the telephone."

Teaching Technicians to "Turn Off the Lights"

Mr. Scheuer. Secondly, how do you educate technicians?

You are a very first-class technician, professional especially in the field of engineering. How do you educate engineers who are educated specialists. There are hydraulic, mechanical engineers; there are electrical engineers. They aren't even educated as engineers. They are educated in degrees of engineering specialties.

How do you educate engineers and architects and the professionals who create the capital plant of our country, the bridges, the highways, the roads, the industrial systems, to be sensitive to the environmental fallout of those systems that they are designing and to include in their design, without mandate of law—and you know the law is not all that effective; it can only do minimally what can be done much better at earlier stages—how do you get the technicians who are designing the facilities, the

plant, to include in their cost-benefit analysis as well as in their design what ought to be put in, what will enhance the total product from the environmental point of view and minimize whatever environmental fallout must necessarily flow?

I know that a road has to have some negative environmental impact, a bridge does, a housing project does unless it is unusually creatively designed, a powerhouse. Now, how do we build into the program engineers and technicians who are sensitive to the fallout they are producing?

Mr. Conway. I think the point you make is very well taken and the question is rightly asked.

When I was in school studying I was basically a mechanical engineer, but I did have to take courses in electrical and civil engineering, but we had no course in the field of ecology.

If anyone had used the word, I don't think I would have understood what it was. We had no attention directed along that line. In fact engineers in the early days gave little or no attention to what we would today call beautification.

Mr. Scheuer. Of course, the word "ecology," has nothing to do with beautification. Essentially it comes from the Greek, "oikos," which means the house we live in. It's the housekeeping concept and its sphere is our home.

Mr. Conway. We have seen, at least in the electric utility field the last ten, twenty years, an evolution in the education of engineers and technicians. We try to have them be more than just technical experts or to approach problems just solely from a technical point of view.

We began to recognize the need for powerplants to blend into the area and to be more pleasing to the eye. We now take into consideration esthetics and that's been an educational process.

We are now at the stage and already past the stage where environmental considerations have to be taught and understood. We should start at the primary school level. . . .

When you get down to it, the proper study of ecology is really a moral question. At school and even at home the children should be taught ethics and morality and, as the student moves along, by the time he goes into law or any professional field, he has been taught over the years standards of ethics, which really is how you live with your neighbor. Really, when you get down to it I would suggest that in the final analysis that is what it is—it is ethics and morality.

Mr. Scheuer. "How do you conserve your house?" as the Greeks put it.

Mr. Conway. Very good.

Mr. Scheuer. Well, how do we get that into the engineering schools?

Mr. Conway. I was an engineer as an undergraduate but I left it right after I graduated from school. So I have been more of a lawyer than I have an engineer. But in defense of engineers, my experience has been that once they get the idea, an engineer or a scientist is more adaptable to this way of thinking than others. In C. P. Snow's concept of two cultures, I find it's easier for the technical man to cross the bridge and pick up the other side and he's usually willing to do this.

I am concerned a great deal I think on the other side of it, the liberal arts student and the lawyer—their inability to cross the other way and understand the technical scientific field. We really have to have both sides understand the other.

I think we can teach engineers and I think they are learning, they have been learning. But on the other hand I find that many of those who are well motivated—and I have said this up at Columbia Law School—the lawyer who wants to get in there and wants to correct things too often is ignorant. He says, "I want to stop thermal pollution of the water, this is wrong and we have to stop it." We may recommend and we may draft laws that can and will eliminate or prevent the thermal pollution of the water. But it may cause worse effects, unintentional effects if we really don't understand the technical, scientific facts of life.

In my limited experience in this field, I find it has been more difficult for me to get the nontechnical man to understand the technical facts than vice versa.

But there is a problem both ways.

Mr. Scheuer. Well, John, you have left us with a ray of hope. Thank you very, very much for your testimony.

Mr. Conway. Thank you.

Mr. Scheuer. Thank you very much.

. . .

[The next witness was Dr. Thomas Vinci, Assistant Professor of Education, Fordham University. He submitted a prepared statement for the record.]

Introduction of Joe G. Moore, Jr., Vice President, Eastman Dillon, Union Securities, Inc.

Mr. Scheuer. . . . Mr. Joe Moore is vice president of Eastman Dillon and Company. I met Mr. Moore in San Francisco a few months ago where he made a notable contribution to the UNESCO conference on environment, and I asked him if he would be willing to testify when we had our hearing on this bill.

He has graciously consented to do so. We are very happy that you are here.

Mr. Moore. My name is Joe G. Moore, Jr., and I am vice president in municipal finance for Eastman Dillon, Union Securities and Company, New York. I appear here today as an interested citizen and former commissioner of the Federal Water Quality Administration.

I assume this statement can be put in the record.

Mr. Scheuer. Yes, your statement will be printed at this point in the record in its entirety prior to your testimony.

Mr. Moore. Yes.

(Mr. Moore's prepared statement follows:)

STATEMENT BY JOE G. MOORE, JR., VICE PRESIDENT, MUNICIPAL FINANCE, EASTMAN DILLON, UNION SECURITIES & CO.

. . .

What I say here today represents my own personal views and elaborates opinions I have expressed in private correspondence on several occasions.

Choosing Among Competing Alternatives

Environmental utilization is primarily a choice between competing alternatives. Various uses result in both valuable end products and impairment of the environment. Hardly any natural resource can be used without some damage to the environment. Traditionally, there has not always been a weighing of the detriments against the advantages. Where there has been a real, conscious attempt to measure and weigh these elements, environmental detriments have been given such low values that the return from exploitation has in the past outweighed the potential environmental damage. . . .

Since I am now associated with the investment banking community, I will comment on the role of economics and public finance in . . . an integrated approach to the study of environmental problems. One of the major considerations often lacking from presentations of major public policy issues is comprehensive discussion of costs or financing alternatives. Costs more often receive attention than do means of financing. Today, however, the sociopolitical decisions are increasingly impacted by cost and financing considerations. Proposed solutions do not get much attention without cost questions being raised. Advocacy of various solutions should include cost and financing analyses.

With increasingly sensitive appreciation for the quality of our environment and because scarcity of an undefiled environment enhances its value, in the choices between natural resources utilization and environmental damage the scales are currently often tipped against resource use. The real controversy now centers on those natural resources already damaged—whether they should be restored, if so, how? and who should pay restoration costs. How can land ravaged by surface mining be recovered and at whose expense? How can the adverse effects of acid drainage from abandoned surface and subsurface mines into our water courses be halted and who should pay? How can the quality and esthetics of our water-courses be regained and who should pay? How can we reduce the massive discharge of pollutants to the air we breathe arising from our own industrial and domestic activity and who should pay? You will note that these questions require analysis, i.e. some feasible means for correcting the situation; evaluation, i.e. some yardstick for measuring the cost; and choice, i.e. a selection of the means by which payment shall be made. These determinations and their successful implementation require a wide range of talents—technological, economic, and socio-political. Ideal technological solutions are slow in being effectively applied unless they have adequate political backing. Acceptable scientific remedies with strong political support will fail unless the economic bill is paid.

Cost alone should not be determinative, however, i.e., neither the economist nor the public finance expert should be permitted to make the ultimate choice based exclusively on the application of his expertise—just as the choice should not be left to the industrialist, the biologist, the wildlife expert or the conservationist. Nor should those involved in costs and financing be allowed to tabulate the costs and benefits utilizing only tangible or assessible factors. Cost-benefitting is not yet an exact science. Public finance experts tend to want all factors reduced to mathematical terms. Stress on computer capability tends to promote the idea that all questions can be reduced to precise terms and the "correct" or "proper" answers or decisions factored by formula. Such an assumption might be valid if the world were populated by machines rather than people. Here again, there is a risk of economic and financial oversimplification.

Furthermore, values are fluid—not static, and economists are sometimes slow to recognize new values. Since man's values and needs change, what is "uneconomic" or "too costly" today may be economic or "cheap" tomorrow. Economics is relative and even economists aren't always aware of the relationships and their changes. People today will pay a much higher "cost" or forego much more economic benefit to protect the environment than they would a decade ago. One of the traditionally accepted uses of water has been dilution of untreated wastes and of waterways has been as transporters of untreated wastes. These uses no longer enjoy substantial support. An "esthetic" use of water, very difficult to quantify or evaluate, is receiving increasing recognition.

Here we identify another educational need to which H.R. 14753 is addressed, educational programs in our elementary and secondary schools and for the public generally as well as for special interest groups. "Environment" and "ecology" are today very popular words; those who can discuss them with apparent knowledge are on the side of the angels. These words are not always fully understood by the experts and even the experts can't always agree on the best course for "environmental" or "ecological" protection. We as a people face difficult decisions. Some choices may well require restraint in our affluent way of life. We may have to forego some luxuries. How well prepared are we as a people to make the hard choices if the "best" choice means a lower standard of living or a higher cost? Since both the costs and the consequences fall ultimately on the people, we will need most of all an enlightened citizenry.

I have a great deal of faith in the ordinary citizen of this country to control his own destiny. Despite the fears of big government and big business and outward chaos that sometimes surround and seem to engulf us, I believe the people of this country still can decide the issues which affect the course of their lives provided they are given adequate facts upon which to base a judgment. I'm willing to abide by those decisions after the facts are available.

Often, however, government fails to provide the facts it has, or distorts those facts to its own ends, or refuses to help discover other facts that should be available to the citizen's decision making. I do not believe that a governmental agency can better decide for people than people can decide for themselves how it is they should live. I do believe government has a responsibility to make its expertise available to its citizens or foster the development of the expertise it feels is needed for its citizens to meet the challenges they face. Our children, more than we, will be affected by what we do to the environment. They will need knowledge we did not and do not possess. To begin now to accelerate the development of that knowledge is none too soon.

All of us can bemoan the poor quality of our environment. We can change it only as the public generally understands the issues and supports the chosen solutions.

. . .

[*After a brief discussion of the problems of interdisciplinary organization in universities, Moore and the subcommittee examined the potential usefulness of cost-benefit analysis in solving environmental problems.*]

Non-Measurable Costs and Benefits

Mr. Moore. One of the things that concerns me about financing and cost and economics is that we have a tendency to want to reduce things to pluses and minuses and add up the columns and determine it comes out plus or minus. Cost-benefit analyses can only measure things that are capable of being measured, and there are some things in the environmental field that can't be measured in the traditional sense.

Mr. Scheuer. Can you give us a list of things that can't be measured?

Mr. Moore. All right. What value is a water course just for the people who walk beside it but don't water ski or swim? They don't want it to smell bad. It could be severely polluted but it might not be obvious to those walking along the bank.

There has to be an understanding of things other than those that can be measured or added up or subtracted in terms of arriving at a cost-benefit analysis. And really all of us should have the right to pay more than the cost might be, if we want something more than the cost, that is to say, cost should not necessarily be the determining

factor when it comes to environmental considerations.

If we want to pay more and get a better environment, I think we should pay more—be allowed to pay more—and get a better environment than a cold arithmetical calculation might justify.

And I think one of the areas in which we have been unable to fully advise the people in this country is in the area of what the costs are. I don't think the average citizen has any grasp of the relative costs of different qualities as they might affect him and the way he lives and his way of life. I think there is a contribution that can be made by those who know something about costs and finances and so on.

. . .

Computerized Econometric Models

Mr. Scheuer. . . . Couldn't we provide our decision-makers with more sophisticated measures on which to make those choices?

You talked about cost-benefit before. We build a large-scale housing project. We build a road program. We build a dam. We build an atomic energy installation. We build a utility on the East River.

We know that each one of these things are going to have environmental fallout, . . . the most of which can be expressed in dollar terms, some of which can't.

Do you envisage that we can build an econometric model of a region or perhaps of a major portion of the country or of a country or of the entire nation itself or conceivably the planet, whereby if they decide to build a steel mill or a smelter on a particular point in the Ruhr Valley and you put in the computer all the information about the kind of fuel, the hours, the volume, the seasons of the year, there would be a printout of that computer that would give you the environmental fallout from the whole Ruhr perhaps passing over half a dozen national boundaries, air pollution, water pollution, noise, and the works? Or if a particular automobile is going to be produced, 350 horsepower, . . . we [can] know a certain amount of pollution [will be produced]? Or a road program is contemplated, what is going to be the environmental fallout on the national community and the community where that plant is being located?

Could not a computerized econometric model give us a far more sophisticated appraisal of the cost-benefit we are gaining from this and the trade-offs we are making without knowing we are making than our most sophisticated executives can make now, flying by the seat of their pants, which is the way they are flying on these decisions?

Mr. Moore. I think it is possible. With my remarks about cost-benefiting, I did not mean to imply that you should not ultimately try to cost-benefit the other environmental factors into the construction of physical facilities.

There was a time when we did not assign a value in the lakes for example—you were talking about the reservoir—we did not initially assign a benefit to the recreation aspects. That's included now. We are analyzing, and attempting to develop the sophistication to analyze the benefit that arises from the recreation use of a reservoir.

There is a technology being developed for assigning values to benefits that were not heretofore considered, and the question is: Have we given too much emphasis to a given value, as opposed to another value? I think it is possible to cost-benefit some environmental questions so long as you understand the first time you do it you will leave something out. The danger with cost-benefit analysis is that people who use it decide that it is perfect, and it tends to become fixed in their minds as the yardstick they use when they measure values.

Mr. Scheuer. Look. At best it can be a rule of thumb, more of a rule of thumb, than the half-baked measures we use now.

Mr. Moore. And in terms of the econometric model you describe, there is probably not adequate hardware to get a given result but that's no reason not to try to develop the software, because by the time you take the bugs out of the software the hardware will be perfected. For most regions of the country there ought to be an econometric model.

. . .

An Environmental Rating of Cities for Municipal Bond Investors

Mr. Scheuer. Could you see the possibility that in some future time in rating the municipal bonds of Grand Island, Nebraska, or Little Rock, Arkansas, or New York, that Dun & Bradstreet and Moody's and Standard & Poor's would include in their rating—in putting, evaluating, appraising the credit of a city—that they would include in their appraisal of the bonds or long term debt of that city not only how the city is running its short, middle and long term debt management, but also how it is managing its environmental problem? . . .

It is clearly going to affect the people who live there, the tax base and the residential plan and the business that's going to feed off the residential plan.

Could you see a connection between how the city is treating its problems of air pollution, water pollution, garbage disposal, with the way you rate its bond tomorrow?

Mr. Moore. I must say that's the first time I have heard that idea, Congressman, so my reaction will be sort of off the top of my head.

. . .

I can see a time arriving for what you mention, but I think it will have to be by stages. I can see a time when for a peripheral city the bonding house would say, "Look, there's no real justification for you to take this debt on as a peripheral city. This project should be part of a major metropolitan area." I suspect you might come to this over time in that manner.

One of the things that is of concern—and I would prefer not to name cities—but one of the things that is of concern obviously is the present condition of some cities by virtue of their past history of having failed to take care of environmental considerations.

Mr. Scheuer. This is exactly the point I am trying to make.

Mr. Moore. Yes, and by virtue of their failure to take care of environmental conditions in the past, they now find themselves in difficulty financially because they do not have the economic or property base upon which to support their needs.

Mr. Scheuer. If you would name a few cities you would make the front page of the *News* and the *Times* tomorrow morning.

Mr. Moore. I have seen what happens to those who name cities.

Mr. Scheuer. I know; but this is precisely the point I am making. Just as you could name cities that cannot meet their environmental problems today because of what they did or didn't do ten years ago, couldn't you see an effect on the tax rating structures of these cities by what they are doing today because of the way they treat their environment? What will happen? Because this will affect their ability to pay.

Mr. Moore. Yes. Some would say they can look at the performance of a city in the environmental arena, and judge how the city is living up to its obligations in other activities. Are you looking at the cheapest way they can get by in relation to economic development? I believe business is looking in the other direction in the country because I think people are convinced what they do with the environment locally will have an impact on their image to outsiders.

Mr. Scheuer. On their ability to attract top flight executives.

Mr. Moore. Yes. The type of people they want to attract will not look at the wrong kind of environment, so they are looking at the political subdivisions to see whether or not they are keeping up with their environmental responsibilities.

Here again, this requires an educational process developed over a period of time, so there is education and acceptance for what you are trying to do for the environment.

I have enjoyed being here.

Mr. Scheuer. I can't thank you enough for your testimony. It's been very, very stimulating. Very grateful to you.

Mr. Moore. Thank you.

Mr. Scheuer. The subcommittee stands adjourned.

(Whereupon, at 2:45 p.m., the subcommittee adjourned.)

DAY 12

MORNING

House of Representatives, Select Subcommittee on Education
San Francisco, California

May 1, 1970

For the last two days of hearings, the subcommittee met on the West Coast. During its day-long session in San Francisco, a wide variety of viewpoints were brought out in the testimony. The subcommittee heard from an economist, a Sierra Club representative, and an advertising expert during its morning session, and an editor, an ecologist, a philosopher, and two students in the afternoon.

Kenneth Boulding, professor of economics at the University of Colorado, decried the "merely moralistic attitude" toward pollution. All human activities produce both "goods" and "bads." We have "bads" because we want the "goods." The problem is not solved by doing away with both, but rather by choosing solutions which give us the "goods" while minimizing the "bads." In order to do this, we must build social structures and a social consciousness encouraging activities which produce more "goods" than "bads." At present, our economic measures (such as Gross National Product) on which we base public policies, do not give us an adequate picture of the economy's welfare aspects. We must build into these information sources, and into the rest of the decision-making process, means for making choices which are environmentally sound, leading to production of more "goods" than "bads."

Peggy Wayburn, a member of the Sierra Club and also vice president of the advisory committee on conservation education of the California State Board of Education, described the activities of the Sierra Club in educating the general public about conservation issues and made several specific suggestions for improving the bill. She particularly stressed the need for going beyond traditional, formal educational institutions and the urgency of general public education—there is not time enough to wait for an entire generation of youngsters to pass through environmental education programs in the schools.

The next two witnesses emphasized the need for radical, fundamental changes in American society and expressed strong reservations about the federal government's capacities for bringing this about. Jerry Mander, director of Friends of the Earth and part-owner of an advertising firm, questioned the willingness of those in power (including both politicians and federal bureaucrats) to fund programs seeking to change the very structures—social, economic, and political —which gave them their power in the first place. He pointed out the tendency of established powers, both in government and in business, to "co-opt" radical reform programs, and, in the process, take all substance and impact out of them. As an example, he described advertising by public utilities, in which the companies proclaim "all the wonderful things they are doing to save the environment." They "assure" the people that they are taking care of the problems while, in reality, their "solution" to environmental problems is nothing more than a public relations campaign.

Stewart Brand, editor of the Whole Earth Catalog, *supported in even stronger terms the reservations of Mander about government "interference" in the environmental movement. He listed a limited number of very specific areas in which government activity might not "poison" attempts to restore and improve environmental quality. Congressman Brademas, with evident perturbation, questioned what he called this "superduper free enterprise attitude," asking Brand if he had fully considered its implications. In Brademas' view, the absence of governmental intervention would leave us even more at the mercy of the big polluters than we are now.*

The subcommittee met pursuant to notice at the Morrison Auditorium, California Academy of Sciences, Golden Gate Park, San Francisco, Calif., Hon. John Brademas presiding.

Present: Representatives Brademas, Reid, and Hansen.

Staff members present: Jack G. Duncan, counsel; Maureen Orth, special consultant; and Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The Select Subcommittee on Education and Labor of the House of Representatives will come to order for the purpose of further consideration of H.R. 14753 of the Environmental Quality Education Act.

The chairman wants to express on behalf of himself and his colleagues how very pleased we are to be in the state of California and in this particular location.

The purpose of our hearings today is to give further consideration to legislation that has been introduced in the House of Representatives by the gentleman from New York, Congressman Ogden Reid, who is with us here today, and the gentleman from Idaho, Congressman Orval Hansen, who is here as well, by Congressman James Scheuer of New York, and by myself.

. . .

[*The subcommittee first heard from the Honorable Jeffery Cohelan, congressman from California. Cohelan, in endorsing the bill, proposed that environmental education courses be required for all students, and, to this end, suggested offering a direct incentive to schools which institute such a curriculum. Cohelan entered into the record an article entitled "The Lack of Reverence for Nature" by Cleman McCarthy, reprinted from* The Washington Post.]

Mr. Brademas. The Chair would . . . like to express its gratitude and the gratitude of the subcommittee to all officials in the California Academy of Sciences for having made it possible for us to meet at Golden Gate Park.

For the benefit of those who come to sit in on these hearings, the Chair would like to say that we plan to conduct these hearings until about one o'clock, then break for lunch and then we will resume in the afternoon. We shall begin at about 2:30 with a panel of students and faculty from universities and schools in the Bay Area.

Introduction of Kenneth E. Boulding, Economist, University of Colorado

Our next witness is Dr. Kenneth Boulding. Dr. Boulding is professor of economics and [a program] director of the Institute of Behavioral Science at the University of Colorado. He is, as well, the president of the Peace Research Society of the Association for the Study of the Economy, and in 1968 was president of the American Economic Association.

Members of this subcommittee are familiar with Dr. Boulding and with the many contributions that he has made from his vantage point as a distinguished economist in the consideration of some of the important social and public issues that face our country and we are particularly pleased, Dr. Boulding, to welcome you to our subcommittee this morning. Go right ahead, sir.

Dr. Boulding. Thank you very much, Mr. Chairman. I appreciate this opportunity very much to testify to this distinguished subcommittee. I should say this year represents my 21st birthday as an American.

Mr. Brademas. Happy birthday.

Dr. Boulding. The ecological crisis which is reflected in the intense activity around Earth Week in April 1970 is perhaps more a reflection of a change in man's awareness of himself and his environment than of any immediate change in the environment itself. It is significant that the intense interest in the environment this year has been generated not by any dramatic ecological crisis, such as the Dust Bowl and the dust storms of 1934, which produced the Soil Conservation Service, but rather by a sudden increase in awareness on the part of considerable numbers of concerned people, about the dangers of the course the human race is taking and the possibility of ecological disasters in the future.

The Basic Problem: Production of Bads with Goods

The threat to the environment is created by the fact that virtually all human activity produces both goods and bads—that is, negative goods—in processes of joint production.

Hence, unless there are elements in the structure and organization of society to correct these processes, the increased production of goods, which is what we mean by economic development, almost inevitably produces likewise an increased production of bads.

If we want to increase agricultural productivity, we have to put artificial fertilizers on the soil, which runs off into the rivers and makes them—as ecologists say—eutrophic; that is, good for algae but bad for humans.

If we want the freedom, mobility and social equality which is a product of the automobile—and I have to make the awful confession that I like driving my car—we are also going to produce a large amount of atmospheric pollution. If we want the possibly illusory sense of security which a large military establishment gives us, we must also face a positive probability of nuclear war and the almost irretrievable ecological disaster which this would produce.

Even the present excitement about the environment has produced a certain amount of nonsense—acadamic nonsense—along with the wisdom which might be informative.

Reducing the Bads

The intelligent response to these problems is to set up a social structure and organization which will encourage those forms of human activity and processes of production which produce more goods and [less] bads and which particularly produce those bads—if we have to produce them—which have a short length of life and so quickly disappear, for one of the nice things is that bads do depreciate.

This can be done in many ways, through the tax system, for instance, by taxing the production of bads, through such devices as effluent taxes and taxes on automobiles, graduated according to the amount of pollution they produce.

It can be done also by what we might call counter-organization, through the development of governmental research, through watchdog organizations which can detect and restrain pollution, and so on. You might call this the institutionalizing of Mr. Nader. [Laughter.]

The Importance of and Hope for Environmental Education

These structures and organizations, however, will not be created unless there is wide public awareness of the nature of the issues. This can be done most effectively through the educational system.

It is for this reason that I regard the present bill as a very important contribution to the long-run solution of these problems, problems of a gravity indeed which may even involve the whole question of human survival.

The danger of the kind of public excitement that Earth Week has produced is that it is temporary. People are aroused at the moment but soon revert into their ordinary patterns. Just as it is constant dropping that wears away the stone, so it is persistent education and organization which is the most effective means of long-run social change.

I believe this bill would create in our society an organization producing, as it were, a bias towards human survival and a better society. This may produce much more effect in the long-run than more dramatic but essentially temporary excitements.

This bill, if it is passed and funded, will provide a demand for environmental quality education. This demand may easily simply be inflationary, however, if there is not a potentially elastic supply. Not even Congress can buy things that are not on the market, and the wise congressman will certainly look into this question before voting for the bill.

Fortunately one can have a good deal of optimism on this point. The environmental enthusiasm of this year has created an enormous interest in these problems in the whole academic community in this country. There are large numbers of people raring to go and who are held back only by the absence of an effective demand.

Furthermore, there are a number of organizations which are already in existence which are skilled in the kind of activities which this act would require and who could easily devote capacity and skills to this problem.

The Social Science Education Consortium—that I am associated with—for instance, has already done a great deal of work in the form of curriculum in the social sciences, and constitutes a fund of experience and skills which can easily be brought to bear on this problem.

Other organizations, such as the Joint Council on Economic Education, are excellently equipped to provide the services which the act is going to call for—and there are many others; I only mentioned the two that I am familiar with.

I have every confidence, therefore, that the act would produce a creative response in the academic community.

The Feasibility of Ecological Solutions

There is a dangerous tendency among some members even of the academic community to regard environmental problems as essentially insoluble and hopeless and hence to retreat into a kind of ecological eschatology, which preaches and bemoans and sits around to wait for the inevitable end.

This is not only nonsense but dangerous nonsense.

The history of the last great ecological crisis, that of the 1930s, which resulted in the Soil Conservation Act of 1936, shows that once people are aware of an ecological situation they do in fact do something about it.

Now, if you really wanted to see an ecological crisis you should have been in Chicago in 1934 as I was when the dust of Kansas and Nebraska piled up in the streets like snow. It was highly visible.

The soil of this continent is almost certainly in much better shape than it was in the 1930s, thanks to the creation of what is essentially an educational agency in the Soil Conservation Service. The kind of education that we need for the present ecological crisis is, of course, more diffuse and perhaps harder to organize than that needed for soil conservation.

Nevertheless, the historical experience points up that wise resource management is essentially an educational problem and the remarkable success of the Soil Conservation Service in achieving a technological transformation in American agriculture indicates that there are strong reasons to suppose that these problems—even the problems of today—are soluble.

The Danger of Unfulfilled Expectations

The bill that is before this committee should receive widespread support from all those who are concerned with the problems of the environment. Nevertheless, it is perhaps not inappropriate to utter a certain word of warning, for with the best will in the world, the political process—like other processes of production—occasionally produces more bads than goods.

The experience with President Johnson's International Education Act has sensitized the academic community to acts of Congress which arouse great expectations and then are not funded.

The impact of the International Education Act, indeed, on education and research in the international system has been little short of disastrous. It aroused great expectations which were not fulfilled and these expectations, furthermore, led to a certain drying up of private sources of funds so that the end result is that the whole field of international systems research has suffered a severe setback precisely at the moment when it is one of the most necessary fields of research and education if we are to avoid the ecological disaster of war and the ultimate ecological disaster of nuclear war.

I would personally like to see a recognition in the present bill that the present international system is the most likely cause of ecological disaster for the human race and perhaps some provision which would make amends for the disastrous consequences of the previous International Education Act.

I would, of course, not wish to see the present bill jeopardized by any attempts to broaden it to the point where it could not succeed. Nevertheless, I would like to

draw this matter to the attention of the members of Congress. . . .

I feel that the experience with the International Education Act should be in the minds of the sponsors of the present bill, for if this bill also arouses great expectations which are not fulfilled and if it leads to the abandonment of this field by the private foundations and institutions, the end result could easily be negative. It would be most unfortunate if a bill which promises so much good should turn out to have these adverse consequences.

Mr. Brademas. Thank you very much, Dr. Boulding, for a most provocative statement. I would just like to say one word about the International Education Act because, as you know, I was the sponsor of that bill in Congress and the chairman of the special task force which read the bill and I share with you a profound unhappiness that Congress has not appropriated a dime for the program since President Johnson signed it into law in October of 1966. . . .

GNP vs. Environmental Quality

Let me ask you this question, Professor Boulding:

A couple of weeks ago a story appeared in the *New York Sunday Times* Magazine by Edmund Dale in which Mr. Dale—the economics reporter for the *Times*—said, commenting on the environmental issue, that it was a false dichotomy to oppose technological progress to the protection of the environment because, he said, whether we like it or not, we are going to have an increase in the GNP in this country, and I wonder if you could give us some comment from your vantage point as an economist on this whole question, on the relationship between an increased gross national product, advancing technology, and the problem of protecting the quality of our environment.

Is it necessary for us to choose one or the other? Would you expand a little bit on your bads versus goods analysis?

Dr. Boulding. Yes, thank you. I think the gross national product is a very inadequate measure of what you might call welfare aspects of economic activity and I think the national income statistics do need provisions to account for this environmental depreciation: that is, we deduct the depreciation of capital from the gross national product in order to get the net national product; but we ought to deduct more in the sense of what would be necessary to overcome these environmental deteriorations, in which case I think the economy wouldn't look as good as it does now.

But there is a misleading element in this, in the GNP itself, which I think is quite serious because, if the social and economic indexes are misleading, often it is very easy to base false policies on them.

I would strongly urge that we make the economists take another look at this and I am afraid that the profession hasn't been doing it.

Mr. Brademas. I would press my point a little further. I note that Senator Muskie, who as you know is a great champion of pollution control measures, said in New York that we could not, say, return to the view of "Let's go back to the plow," but that we ought to try and harness technology to help protect the environment.

Do you have any comment on that?

Dr. Boulding. I agree with the Senator. In other words, the problem is not stopping the increase of knowledge, for instance, or its practical application, but of directing this along the right lines—that is, it is a question of what technology and how we are going to direct our research, particularly our research and development activities, toward the discovery of those technologies which, as I suggested, have produced more goods and less bads.

I think we have to go on to further knowledge and even more technological knowledge, but we do have to count all the costs and this we haven't been ready to do, and this requirement requires better organization.

I think a merely moralistic attitude to pollution is bad. This is nonsense. That is, we don't have pollution because of wicked people, even of wicked corporations, but we have pollution because we want the goodies and so the baddies come along with it.

Mr. Brademas. Thank you very much. Mr. Reid.

Controlling the Bads

Mr. Reid. Thank you, Mr. Chairman, and thank you, Professor Boulding, for your very thoughtful comments. What would you suggest specifically about taxing the bads, making corporations responsive to the environment?

Dr. Boulding. Well, yes, I think a great deal can be done through the tax system if we can identify the bads and value them. That's the difficulty, that they are hard to identify. I have been struck with this problem over the last three or four years, in the sense that when we come to things like the atmosphere—or particularly the study of the earth, of the total system—we really are involved here with an enormous area even in the natural sciences that we don't know much about.

Mr. Reid. On the other hand, the gross picture can easily be identified, specifically if you take lead out of gasoline?

Dr. Boulding. Right.

Mr. Reid. But when you get into nuclear powerplants which I prefer not to see built . . . [applause], the question is how to effectively mandate that a corporation or powerplant must not be permitted to do anything that seriously harms the environment?

Dr. Boulding. Well, there are really two problems here:

One is the problem of longevity of the bads versus the goods. This is the danger of radioactive pollution that stays around. If the pollutants would go away somewhere else, it would be all right—but they don't. If pollutants stay around in the earth, then the longer lasting ones are very dangerous indeed. I think there is a strong case for prohibitions. A prohibition is . . . an extension of the tax system and, obviously, this is part of the armory of legislation.

All that we really are going to tax, however, is ourselves, and we have to pay the price for this. If this means doubling the cost of electric power, there are going to be squawks. There is a considerable assumption on the part of many people who are being naive, that we can clear up pollution without any cost to anybody. That isn't so.

Effects of Controls on Rich and Poor

The other problem is to be sure that the cost doesn't

fall on the poor. There is a grave danger that the obvious solution of environmental problems is to allow the rich to go on polluting and prevent the poor from doing it.

Part of our very pressure on the environment today is a result of the fact that the mass of the people now can enjoy many of the things which were previously the privilege of a very small part of the population. We have to be very careful that we don't go back on something which is very dear to all our hearts.

The distributive aspect of environmental regulation always has to be taken into account. You can even argue that the results of the last two environmental crises had some adverse effects on the poor. The first, under Teddy Roosevelt—and they come along about every 30 years, it seems—was the one that created the national forests and so on; it may have had an adverse effect on the poor in the sense that it prevented them from moving into the Rocky Mountains; the national parks and national forests had some effect in keeping the poor people out of the mountains. Even soil conservation in the 1930s, as I appraise it, had some impact in driving the poor people out of agriculture. If now we try to solve the present problem by a tax on automobiles used to subsidize public transportation, the rich will continue driving the cars and the poor will have to ride the bus—which I won't like at all. I would much rather be rich.

But particularly we must trace these distributional effects.

A Capital Budget for Resources

Mr. Brademas. Mr. Cohelan.

Mr. Cohelan. I am wondering, to exploit your professional capacity, Dr. Boulding, if we could explore the possibility of developing a capital budget where we could put in or show some national depreciation; would this be a good first step to dramatize the arrangements?

Dr. Boulding. I would very much like to see an attempt at this. I think it is quite difficult in the sense of the great uncertainties, such as the impact of human knowledge which obviously has to be part of the capital budget; up to now, for the last 200 years, the increase in human knowledge has more than counteracted the using up of resources in the sense that we have created new resources through the advent of human knowledge, but this cannot go on forever.

Some dramatic assessment of the limitation of this, I think, would be very desirable at the moment.

Population Problems and Controls

Mr. Cohelan. One other question, Dr. Boulding. The Corps of Engineers has done a study that I think says in the year 2020 in this magnificent Bay Area—the land of my birth—there will be 20 million people. Now, if this projection is true—and on the basis of the present growth rate it appears to be true, it appears to be moving in that direction—what do we do about the energies to support this kind of population?

Dr. Boulding. Well, one way to prevent this is to create water shortages. If California didn't have such a beautiful water plan you wouldn't face all these environmental problems. Well, the one thing I learned about population projections is that they are all wrong—I think almost without exception—and I hope this one will not be true, either.

Mr. Cohelan. Well, I think whether it is 20 million or even considerably less, there is a tremendous growth in terms of the . . . resource requirement; . . . may I ask how you approach the problem on population? Many of our scholars and thinkers in the field are talking about zero growth; what is your attitude toward that?

Dr. Boulding. Well, of course, in the United States the outlook is optimistic, in that the fertility [rate] has been declining very rapidly in the last ten years; if it continues to decline at this rate, which it probably won't, we will be in sight of a stationary population by the end of the century, but, as I say, this could be wrong.

If this goes on we may not be able to do much about it. I have my own solution to this problem, but nobody is taking it seriously. I have my green stamps plan for population where everybody gets 110 green stamps, which entitles you to one legal child. We don't want the government breathing down our necks in the bedroom, which is rightly something private.

On the other hand, we may have to face some kind of social regulation and, of course, the problem is how do you have social control without intolerable intervention in individual liberties. That, of course, is a problem you gentlemen face all the time.

Mr. Cohelan. Thank you.

Mr. Brademas. Mr. Hansen.

International Aspects of Pollution

Mr. Hansen. Thank you, Mr. Chairman, and Dr. Boulding, for the most useful contribution you made. You have made some reference in your statement to the international dimensions of the problems of polluting the environment. Obviously, pollution does not know national boundaries and in any long-range effective solution it has to involve cooperation across the national boundaries.

Let me ask you two questions with respect to the international aspects of the problem:

First of all, to what extent are we ahead or behind other parts of the world in this awakening that we have just experienced to the nature of the threat? And, what institutions or mechanisms do you see that are promising as the basis of the kind of cooperative international effort that will be needed to preserve the quality of the air, of the water, of the world that we live in?

Dr. Boulding. Well, with regard to the first question, the only part of the world that I think is very much aroused about these problems is Western Europe. The socialist countries have only just become aware of them and I notice that the Russians have been all excited about it this year. I think they have had even worse ecological disasters than we have had and one of the things in this whole area is that socialism is no answer to anything; look what the Russians have done to the Caspian Sea, they messed it up completely; the Volga is a disaster and they plowed up plains that they shouldn't have, and all sorts of things they have done. The other socialist countries have met disasters also but they are beginning to be aware of this.

Now, I am struck, when I go back to my native country of England, by the extraordinary improvement over the last ten years. Now, I am a native of Liverpool and it was a filthy city. If you think environments today are bad, you should have seen what I had to smell as a child in Liverpool; but today it is very much better, which suggests that these things can be improved. Actually the British have an easier problem in . . . that coal is easier to clean up than the pollution of an inversion, for instance, such as we have in Los Angeles. But they have done certainly a great deal about it.

On the matter of international organization, I would like to see the United Nations in this area. I am hopeful that the United Nations conference on this subject in 1972 will produce a United Nations organization in this field. This is very badly needed because, as you say, pollution knows no national boundaries at all.

Our pollution does go out over the Atlantic and most of it disappears before it gets to Europe but things like radioactive pollution or DDT pollution require an international oganization.

Mr. Hansen. Thank you very much.

Religious Aspects of Environmental Concerns

Mr. Brademas. I have just one other question, Dr. Boulding. One of the witnesses on this legislation was Professor Joseph Sittler, of the University of Chicago, and he told me that he is writing a book which will have the title of *Theology of Ecology*, which is trying to draw some implications for religious thought of the increase of awareness of environmental problems. I know that you reflected on some of those relationships as well, and I wonder if you have any comment on that development?

Dr. Boulding. Well, I think this is ultimately, certainly, an ethical problem and I think one can almost say a theological problem in the wide sense of the word, in the sense that it involves the nature of the meaning of the universe and of the whole human enterprise.

This is a very profound change in man's image of himself in the sense that up to now he has always lived, and he has been expanding, in what seemed like an almost infinite earth. This presentation is the juncture where we suddenly realize that the earth is a small spaceship and that it is closed. This happened in my lifetime. When I was a boy in school, there were still white spaces on the globe with nobody there. Now there aren't any.

Now we have been on the other side of the moon. One of the results of the space enterprise is to make us very lonely because it is clear that this is the only decent bit of real estate in this part of the universe and that we better look after it!

Now, the traditional religious concept which is appropriate to this problem is the concept of stewardship, that man is the steward of the earth and all of which it contains—which, of course, is a very important concept in the Christian tradition and also in eastern religions. I think this is an almost universal religious concept.

This is one that has to form the ethical and religious basis of the spaceship earth.

Mr. Brademas. Well, I know, Dr. Boulding, you have contributed enormously to the dialogue on this issue. We are grateful to you for that. Your testimony has been most eloquent and we want to wish you a happy 21st birthday as an American, as you go into your third decade in citizenship.

Mr. Reid. And many, many happy returns in the future.

Mr. Brademas. Thank you very much, Dr. Boulding. We will take a brief recess.

. . .

[Following the recess, the Chair read some excerpts from a letter by the Honorable Jesse Unruh, which was entered into the record. Donald W. Aitken, director of the John Muir Institute and professor of physics at Stanford University then testified briefly.]

Introduction of Mrs. Peggy Wayburn, Sierra Club

Mr. Brademas. Our next witness is the representative of the Sierra Club. . . . We are pleased to welcome as a witness on behalf of the Sierra Club, Mrs. Peggy Wayburn. We are pleased to see you. Go right ahead.

Mrs. Wayburn. Thank you very much, Mr. Brademas, and members of the committee; I am very happy to be here.

The reason I have been asked to testify for the Sierra Club is twofold:

First, I have been very active in the club itself and, second, I have served as vice chairman of . . . the advisory committee on conservation education for the California State Board of Education. I have been vice chairman of this committee for the three years it has been in existence. So I have been working firsthand and struggling with a lot of these problems that we have just been talking about.

I have to agree that it is rather remarkable and I think very disgraceful that a state like California has not been able to find any money to implement the conservation education programs which we have very carefully, and after a great deal of agony, come up with. I will be glad to answer questions on that later.

Activities of the Sierra Club

I would just briefly like to speak about the Sierra Club and what it has done in the field of education. Whenever I start this kind of testimony, I come to the fact that the club has so many members in it now that that fact needs to be mentioned.

Mr. Reid. You have a few members right here on this panel.

Mrs. Wayburn. I appreciate that. The club was founded about 75 years ago here in the Bay Area and we had 182 charter members. Today membership is approaching 100,000 people.

Our major concern has always been the environment, as I am sure you know; first it was the Sierra Nevada, then it was throughout the rest of the country and then it became the whole problem of man's total environment.

We have, since our founding, been publishing educational materials, trying to reach the public, trying to make people aware of what has been happening to the environment. Our publications beginnings were small, but as you know, our publication effort has become very large.

We have always been concerned about formal education. We have never actually had the means to go into this on a professional basis, simply because we are a volunteer organization. I thought it was worth noting that the club does have one small textbook on conservation education, and I would like to enter it as part of the record of this hearing. It is a book called *How to Teach Wilderness Conservation*, and it was published a long time before ecology and environment became such popular subjects. This, incidentally, was prepared by a teacher member of the club and was published by the San Francisco chapter.

There has been a good deal of conservation education effort within the club on a local community basis.

By the way, I would just like to mention that this term "conservation education" is, I think, a sort of confusing one. I much prefer the definition of "environmental quality education," and I think it is worth noting that the advisory committee here in California has a great deal of discussion on this matter of semantics and what term best describes the kind of education we're talking about. I would like to use the two terms interchangeably, simply because it is sort of a standard reference, the "conservation education" tag.

The Sierra Club would first like to commend all of you who have introduced this bill, H.R. 14753. We think it is a major step; we think it is very hopeful that Congress is getting into this scene which is so terribly important. We congratulate you on precipitating this action. It is long overdue and we strongly support and endorse the principles which are spelled out in this bill.

At the same time, we do feel that the bill as it is presently drafted is not succinct enough, does not define the problem strongly enough nor broadly enough and does not go far enough in its specifics to really meet the needs that are facing all of us now in understanding the cause of our environmental problems.

Urgency of the Environmental Problem

. . . [W]e have recognized that we need strong conservation education in our schools. We have had a great deal of study and we have spent a lot of time in the past three years, and yet we still don't have anything, simply because our legislature did not come up with a bill with teeth in it. We did not have a bill for adequate funding, spelling out what could be done with adequate funding. We speak here from sad experience in our own state and we are urging you in your bill to come to grips more definitely with the specifics and we have certain suggestions along this line.

I would like to refer back to the launching of the first Sputnik in the 1950s when there was a sudden alarm on the part of everybody in educational circles in this country. We had a great educational gap and it was recognized as a crisis. We decided that we would reform our whole educational approach and we did so.

I think that the crisis today is far, far greater than it was at the time of the first Sputnik. We have a much more profound educational gap. It is a much more dangerous one. I think we must respond to the crisis today even as we did then, in terms of crash programs. Now, this crisis has to be articulated and we have to try to really understand the problems that face us.

We have this sort of—well, it's a gap between reality and myth. We have a reality of a disintegrating environment, of everything around us. We can't escape it. We have it here in San Francisco today. We've got smog around us—something that we just thought would never happen, but here it is. This is a reality and we can't get away from it.

Stewardship: Garbage and Natural Resources

We also have in San Francisco the reality—and the myth—of what we do with our garbage. This is a very interesting sort of a problem and I think it is part of this whole thing that faces us. We have for centuries been shuffling our garbage around. Traditionaily in America, we move it from one place to another. We have never really gotten rid of it.

So here in San Francisco we have tried to come up with a solution of what we would do with our mounting garbage. So we decided to ship it up to the mountain counties after using up our local fill areas. When that turned out to be too expensive, why, we decided to ship it south to the peninsula and fill a few canyons down there.

This is part of this whole gap between reality and myth. For we are not coming to grips with the situation; we simply don't have enough canyons to accommodate our garbage ad infinitum. We can't shuffle our garbage about forever; we have to meet head on the problem that we have too much undisposable waste; and this is a new, hard concept. This is a reality that is going to possibly be the end of us all unless we can meet it in terms of what it is.

We are further subscribing to the myth that we can use our natural resources on an open-end basis. I think it is high time that we stopped and looked at this again because we cannot use our natural resources on an open-end basis. They are not going to be there long enough.

We have to re-examine some of our myths and come up with a recognition of the fact that we've got to change our ways. This kind of thing should be articulated and made a subject of your bill. As you have pointed out in your bill, part of our problem is a lack of understanding.

Another major part of our problem is a lack of responsibility. Now, this has been touched on briefly by earlier witnesses who spoke of the stewardship of the earth and I think "stewardship" is a good word. So is "responsibility," and I would hope that this kind of a bill would spell out the fact that understanding and responsibility must go hand in hand in any approach to meeting our environmental problems.

Environmental Curriculum, Kindergarten to Adults

One part of the bill which we feel is excellent and which has not been mentioned this morning is the fact that you do propose to reach the community in establishing educational programs for the adults in the community. We think this is essential.

We don't think there is time to wait for a whole generation of schoolchildren to be apprised of the facts of life. We think it is very important that we reach out into the community now and make available to people some good crash program on the ecological crisis.

We understand that necessarily the drafting of this kind of bill is often purposely a little vague so that it will allow for various interpretations, but we do think that there should be a more specific outline of proposed curriculums. This has already been touched on by previous witnesses.

There is no question but that the whole environmental concept, the whole idea of understanding the environment, is part and parcel of every subject in our schools. It should be so presented.

Incidentally, along these lines I think it is important to understand that our schoolchildren are not as dumb as we somehow think or like to think they are. They are aware that when we teach our American history, we gloss over what we have done with our natural resources, and it doesn't fool the kids. I think it is high time that our American history presented the straight facts of what we have done, not only to our soil but to our timber and to our various other resources. This should be part of the environmental educational curriculums.

We urge that this curriculum begin with kindergarten, and continue all the way through higher education. In California, we have been studying what is being done in various schools because we do have, incidentally, a lot of teachers who are doing a tremendous job in putting over this whole idea. These teachers start in kindergarten, and in first grade, and very successfully get through to the kids what ecology is all about.

So we feel this is an area in the curriculum that's got to have a little more definition in your bill. There have to be guidelines to help some of the states that are not aware of what can be done. . . .

Nature of the Advisory Committee

I think that your commission is necessarily going to have to have certain powers in order to get this thing off the ground. Somebody has got to do it. There is not going to be spontaneous combustion all over the country. There are too many states where people are not aware really of what is taking place. So I think that . . . you've got to have a good working commission of people who know what the score is and who can get this thing going.

I know this is a difficult thing to do, but we would hope that somehow wording can go into the bill to the effect that these have to be working environmentalists, if you will, and that the presence or absence of the degrees—with all due respect to the degrees—is not going to be an essential qualification for the people who serve on the commission. It's got to be people primarily who understand what the problem is.

Methods of Funding

We believe that funding is one of the most crucial parts of the proposed act. Of course, from our own experience here in California we have a very strong feeling about this. We know that money can be found for this kind of thing when people want to really find the money.

As an example, in California we have $16 million in our driver's education fund which seems like a tidy little amount. This has been gotten from fines from people who have broken the speed limit on our highways. We have diverted the fines from our motor vehicles department into driver education.

By the same token we would like to propose that the funding for your bill could well come from the fines levied against polluters by the federal government. We think there should be strict enforcement of the regulations which we now have and we have a possibility here to pick up some of the funding which is so essential.

We would also suggest that there could be exploration in the field of taxing the users of natural resources from the U.S. public lands in order to get funding for an environmental education program.

We believe that funding will be critical in many of the states. I don't think that strings should be tied on the initial funding of this act because there are too many states that are poor and too many states that don't understand.

I think that there should be available an initial funding which can get this thing off the ground and thereafter there can be matching funds or some kind of thing worked out to keep the programs going; but there are too many areas where nothing will happen without federal funding.

I would like to just note in passing that the conservation education work here in California has been done through ESEA federal funding. The work of the committee and the consultant of the committee were paid for out of the funds. So, as far as we have gone here in California we have gone on federal funding. Although we have something like the fifth largest gross national product in the world, we still turn to the federal government.

When you have a poor state, I don't think we can expect it to come up with a going conservation education program. Furthermore, I think there is a very good chance here to hold out a carrot to people to get them going. Everybody wants money, and here is a chance to reach people who are not aware of the magnitude of the problem, to get them interested and to get them involved. . . .

Mr. Brademas. Thank you very much, Mrs. Wayburn, for a most helpful statement. I don't really have any questions to put to you, just a couple of observations of what you have said when you alluded to the Sputnik and the role that it played in helping persuade Congress and the president to get behind the National Defense Education Act of 1958.

I thought we might emulate that precedent in that, maybe, we should have called this the National Defense and Environmental Act and thereby generate a little more support in this. I hope nobody takes that seriously.

Implications of Terminology

The other point that I would like to make, because it seems to me fundatmental to the idea behind the legislation in the minds of those of us who put it together, is that we deliberately did not call it a Conservation Education Act, we deliberately did not call it a Wilderness Education Act or a Nature Education Act, but chose the word "environmental"—as we might as well have used "ecological"—as an adjective to describe the purpose of the legislation because we wanted to indicate that we were concerned with far more than the out-of-doors, but that we were concerned with man and his relationship to all living things—man, as it were, as part of nature.

I take it from what you have said that you would not quarrel with that kind of an approach?

Mrs. Wayburn. Well, as I said I subscribe to this totally. I think that this has great advantage because it lifts this legislation out of what can be a dyed-in-the-wool traditional field. That just can't do the job.

Mr. Brademas. We are in agreement then. Mr. Reid.

Mr. Reid. Thank you very much, Mrs. Wayburn. I want to thank you for your testimony, which has been excellent and for your pioneering work and the work of national importance of the Sierra Club and to tell you how valuable we have found it and how important it has been to helping change the national direction.

I couldn't agree with you more that we need a program and recognition that the environment needs basic help now. I happen to be one of those who believes that we should not only end the war but we should not widen it.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman. I wish to express our deep appreciation for your help this morning. It is evident that you have not only read the bill very carefully, but that you have made a detailed analysis of it and have given us some extremely helpful suggestions that will be of assistance when we prepare the final draft.

The Role of Educators

I would only like to ask your comment on one aspect of the bill. I would be interested in having your comment on the relative role or roles that the educational institutions, the traditional educational institutions and the non-educational institutions, private organizations, may play in implementing the objectives of this bill?

Mrs. Wayburn. Well, I would strongly commend the idea of going beyond the traditional educational institutions—with all respect for these institutions. I have found from my own personal experience, in working on the conservation education advisory committee, that there tends to be a kind of ingrown development where certain ideas are subscribed to and it is just too hard to get off the dime and change the direction. I think we need fresh ideas, fresh approaches, and I think that there is a tremendous resource in organizations and individuals outside the educational field. They can fill a very great need.

I should mention that I think our biggest hurdle in all of this is to reach the teacher and to make the teacher understand the magnitude of the crisis that faces us. Once the teacher understands—and this has happened over and over again—he or she will cooperate and even go beyond what is presented to them. They will get the classes excited and involved and participating and that, of course, is our ultimate goal.

Mr. Hansen. Thank you very much.

Mr. Brademas. Thank you very much, Mrs. Wayburn. We much appreciate you being with us today.

Introduction of Jerry Mander, Director, Friends of the Earth

Mr. Brademas. Our next witness is Mr. Jerry Mander, president of Freeman, Mander & Gossage Advertising.

We are pleased to have you with us. Go right ahead, sir. I wonder, Mr. Mander, because Mr. Reid must leave in 30 minutes and we have two more witnesses, if you would give us a summary. Go right ahead, sir.

Mr. Mander. I will try to skip things, but it may take me longer to summarize than just to skip.

Mr. Brademas. Go right ahead.

Mr. Mander. Mr. Chairman, members of the subcommittee, thank you for this opportunity to comment on the proposed bill.

I assume I've been asked here today because I am a director of Friends of the Earth, but also because I am an advertising man with some observations to make about the media.

In any event, the bulk of my observations are going to be about the media and will take up an area of educational significance which is not in the bill, and perhaps should be. . . .

But first let me say that . . . I support the ideas and direction you have taken. However, I do worry mightily that it may all come to nil, even if it should pass Congress and be turned over to Mr. Nixon for implementation. I worry particularly that in the end, millions will have been spent and nothing will have changed; that we will have educated people to want and perhaps achieve some clean rivers, say, but life styles won't have changed, and we will continue to live in a state of war between technology and the natural system; turning off gas jets while the whole house is burning down.

Will the Federal Bureaucracy Permit Needed Radical Reforms?

The goal of any ecological education program should obviously concern fundamental solutions, but I am concerned that educational programs which, for their funds, are required to get through a federal bureaucratic maze will not be likely to be ones which present fundamental, that is, radical, solutions. For example, as a practical matter, even if this bill passed gloriously, could an applicant ever really get federal funds for a program to, say, study design, and teach an economic and political system based on simple subsistence?

We all know that the only societies which are living in harmony with nature are those which are subsistence societies but can we really believe that federal money would go to promoting such societies as possible alternatives to our own? Or, in another vein, would an applicant be able to obtain funds for programs which advocated reducing gross national product?

Most conservationists agree, at least many, many do, on the need for a no-growth economy, or one that is microdynamic while being macrostatic—which is a euphemism —but I wonder what would happen to a federal administrator who funded a project to educate people to that idea. After all, implied in the no-growth idea is a drastic reallocation of already available resources among classes of people currently on the outs—which is not what you'd call classical capitalism—and any administrator who funded such a project might be the next object of the impeachment fad.

While I am aware that members of this subcommittee

might like to see that sort of diversity represented in the handling of the funds from this bill. I don't see anything in the bill which assures it. And I am not optimistic that the present administration—or any likely ones in the near future—have the knowledge or would find it politically feasible to finance and administer educational projects which have a chance to teach people about solutions which promise to alter the economic and political structure which gave them power.

Man's Role on Earth: Manager or Participant?

What I fear will happen instead is the sort of thing that happened to me when I was discussing an idea with the Ford Foundation for an educational program of my own device. While dismissing my own project—an environmental advertising foundation—as hopelessly naive, this Ford man began to describe the foundation's primary efforts, which were in the education of young children toward a basic understanding of how to "better manage the environment."

I asked him what we were going to do until those children grew up and saved us, which slowed him down a little bit, and then I commented that I thought that that sort of education—managing the environment—would do far more harm than good.

The point is: We are already managing the environment and that is why we are in the mess we are; it is a further example, borrowing a page from the Women's Liberation Movement, of what let's call human chauvinism. It is true enough that we could manage the environment better than we have been, and I suppose in fairness that is what he meant, but who says we should be in charge of the thing at all?

Nobody knows the details of how life on earth happened, or can fully appreciate the immensity of the design and the variety of life forms, but still we are accustomed to think of ourselves as the end result of it all; the final flowering of the process. It hardly matters whether one believes that we were given dominion over other living things, or we just took it, but in any event our excuse is that we've got brains and can use machines, giving us some kind of de facto royalty status.

And so we remove ourselves from the processes that formed all the other living things and forget that the fabric is all connected and we are just a thread of it, and wonder why it's all unraveling. The reason is that one life form—we—have begun unstitching things here and there, creating, weavingwise, an ecological disaster.

Obviously, the only solution is to sit there like all the other little stitches and take things as they come; but we are so far from that now, so far from it, that what kind of government-administered educational program could find it politically feasible to re-educate us to the notion that we are made of the same chemical composition as a triton mollusk and are as much an accident of genetic mutation as it is—and have no greater rights of intervention in natural processes than it does?

It is far more important in my judgment, for example, that such a bill as this assures financing—instead of for a university department of natural resources—for what we might call a department of humilities; a curriculum which would be the opposite of the sort of curriculums that black studies departments have lately been introducing, whose goals are to help some people experience their potency for the first time. Humilities courses would strive for a greater feeling of impotency, respecting the limits of our man-invented technological solutions.

And more significant than "training teachers" to teach ecology, would be the granting of visiting professorships for Micronesian out-islanders, or Eskimos, or other peoples already familiar with the realities of island economies and limited resources, and techniques for living in harmony with them.

If we agree that earth is an island in space, separated by insurmountable distances from any planets which might have similar resources and accoutrements, then the techniques that need developing are techniques for surviving on islands—where the seriousness of cutting down a coconut tree is fully understood—and where an industry basing itself upon cutting and selling more and more coconut trees or fish or breadfruit is, simply, outlawed.

I hope that there is a means of building into this otherwise very significant bill some protection for projects and notions which have the promise of basic solutions; some protection against the editing out of ideas by political appointees.

Ecological Hazards of Advertising

So much for my worries about the administration of the bill. Now, for my remaining time, I would like to discuss an educational aspect of society that is, unfortunately, at least as significant as universities and institutions, and that is advertising.

I would like to put forth the proposition that the way people behave and what they believe in today's America is at least as influenced by advertising impressions as by what they are taught in schools. This is especially true, of course, of people who do not have much of an education with which to put advertising into a context but it is also true of most of us—of all of us.

There is no way of avoiding ads today; they are everywhere, and they influence us concerning life styles, status, standards of taste and behavior, and whatever is new. They are, like it or not, the place where we gain many of our perceptions about the world, whether positive or negative. None of this might seem pertinent, but let me point out that, God save us, advertising men have discovered ecology.

At first, I thought it was a good thing that hundreds of ads began to appear from all kinds of companies, soul-searching about their own products and stating all the wonderful things they were doing to save the environment.

But as my late partner, Howard Gossage, was fond of pointing out, advertising people have an inordinate fascination with "image." They assume that by seeming a certain way, the world will come flocking around tearing at their clothes. Gossage preferred the word "identity" to "image"—having to do with the way one really is—which made him a lonely man in the advertising business.

Well, at one time, the difference may not have been all

that important except for the psychic good health of advertising people. But at this point in history, the way I perceive it right now, the difference may be more like life and death, and may foredoom any other educational effort that's made.

With the sudden, immense outpouring of words from business and industry concerning all the wonderful things they are doing, technologically-wise, to solve the pollution problem—most of these words being expressed in ads—it's worth having looked closely at what's being said and, of course, it's all image and no identity.

Most of the industry still sees pollution and environment questions as more of a public relations and advertising problem—in other words, an image problem—than they do anything fundamental about the way they are doing business.

Shell Oil Company, for example, recently ran a four-ad series showing:

1. how they saved the lives of a lot of fish by not polluting things as much as they had been;

2. how they are feeding starving millions by producing more and better pesticides (which on the other hand are killing the fish they just saved);

3. how they overcame a lovely little Connecticut town's fears that their new gas station would prove a blight because it would replace a number of lovely trees, by showing the townspeople that the station would itself be a lovely gas station; and

4. came out against littering.

I'm sure that the president of that company feels he is a conservationist for this position because until recently it was unusual for an oil company to even mention pollution or ugliness. I would not be surprised if he became the industry's spokesman on protecting the environment.

Now that there is public good will in conservation, now that it's a hot topic, it's "good business to think of the environmental implications of industrial action," as a major chemical company executive recently suggested.

Another example: a recent copy of the *New York Times* carried a Pan American Airways ad which announced the "latest breakthrough" in relieving airport congestion. I was ready to be told they had reduced their total number of flights, or scrapped the Boeing 747, or canceled their SST orders.

But it turned out that what they had done was to build a second terminal at Kennedy Airport in New York, so they could handle up to twice as many passengers with less congestion inside. Getting the planes onto the ground without bumping each other is another matter and getting into New York City from the airport, somehow, was somebody's else's problem. They were doing their bit.

Power Companies' Advertising versus Research

And we've all seen more than our share of power company ads. Usually they bring us one of four urgent messages:

1. Use more electricity.

2. The folks at your neighborhood power company are working overtime to develop new and creative means for winning the war on pollution.

3. We need more powerplants to fill our growing needs—atomic ones, and they're safe as apple pie. (Southern California Edison, by the way, actually had the gall to blandly state in an ad two months ago that nuclear powerplants cause no pollution at all. They simply ignored thermal pollution and radiation.)

4. They need a rate raise to finance the research and the new construction.

I had thought I had already reached the pinnacle of my own shame and disgust concerning utility advertising—what they are doing advertising at all if they are a public utility—when I came across an old *Congressional Record* by chance and found in it a speech by Senator Metcalf which somehow has gone unnoticed by the press and by conservationists. Listen to this:

Senator Metcalf pointed out that during 1969, public utilities spent nearly $300 million on advertising, more than eight times what they spend on research—all the while proclaiming in the ads how much antipollution research is going on. Metcalf also pointed out that about a fourth of all power companies in this country actually did no research at all, while spending millions in advertising to talk about research and to sell us all on using more electrical power at the same time as they tell us there's a power shortage.

If advertising dollars are going to be spent on utilities, one would think—considering this so-called power shortage which makes introduction of polluting nuclear plants "inevitable" in the words of *Newsweek*—that the ads would be appeals to use less power.

I am prepared to make the case that this $300 million in advertising spent by the power companies—which by the way is about a third of the entire federal antipollution budget in Mr. Nixon's budget message—combined with the millions from oil companies, chemical companies, auto companies, industrial associations, the newly burgeoning antipollution industries, and so on—about a billion dollars altogether this year, I would guess, much of it talking about how everything's going to be all right, just don't you worry, industry is taking care of things—is actually producing a net loss in this so-called war on pollution.

It's called "co-optation" in other circles and I believe, fairly certainly, that it's operative here, perhaps not deliberately but in effect.

Information Pollution

I fear that all the recent government rhetoric, magnified by industrial assurances, might have the net effect of encouraging a society already dazzled by technology to be further assured that technology is solving the problem—people want so much to be assured—and so it's back to the television set.

Perhaps even worse than the fact that the ads are misleading, or even lying in many instances, is the fact that they divert the reader from a more central understanding about what's really going on. That technological society is beginning to reach its limits, and expansionism is going to end, and endless consumption is going to end, and we're all of us going to begin adopting techniques of so-

cieties who live on islands and for whom a finite system is given.

The ads are even destroying the word "ecology" and perhaps all understanding of the concept with it.

A few weeks ago, P.G.&E. ran a headline advocating a "balance between ecology and energy."

But ecology is not a thing that is balanced against anything else. The word describes a science of the interrelatedness of everything. Energy is a detail which only man has decided to make a fuss over. That is what must be remembered and it is getting increasingly hard to do so with this immense outpouring of diversionary, false, and deadening information.

While industry is spending a billion dollars putting out this stuff, as nearly as I can determine, conservation organizations are spending roughly $200,000 to attempt to offset it and to accomplish other urgent educational messages concerning one issue or another. That is, roughly two hundredths of one percent of the industrial budget. That much money to educate people to what the industrial ads are leaving out, or saying falsely, or to educate people so that they'll not be lulled into false security.

This is an educational struggle which is taking place right now, today, and without some kind of immense outpouring of counterinformation from conservation groups, I am very much afraid that the ecology fad will be even shorter than anticipated. People will relax and think everything's all right. We will have lost their attention.

Funds to Combat Information Pollution

If you agree with me that there is an educational impact to advertising which is direct and immediate, and considering industry's behavior, critical, I would ask you to include provision in the bill to finance conservation organizations in their efforts to use advertising in the following three educational ways:

1. Fairness doctrine advertising. Friends of the Earth, in concert with other groups, has begun proceedings to apply the results of fairness doctrine case against cigarette advertising, to advertising of polluting industries. If we succeed, as I believe we will, all radio and television stations will be required to provide a conservation organization with time in which they may present a counter message to an ad.

If an automobile company runs a one minute spot advertising its new model, Friends of the Earth could indicate what the implications of the annual style change are, or talk about the pollution from cars, or the raw material that went into building it, or the problem of disposing of it, and the roads needed to run it on.

When a Standard Oil ad appears for its F-310, calling it "the greatest automotive advance in history" we will be able to put it in perspective by showing that it represents only a five-percent pollution improvement, leaving 95 percent to go. And talking about oil spills, and so on.

But even with free air time, and free agency work—there are dozens of ad agencies willing to do it—still, hundreds of thousands of dollars are needed to actually film and produce such spots, and we don't have the money.

2. General educational advertising. As I stated earlier, with respect to the bill as written, the idea here is to speak of basic solutions and basic understanding of environmental problems; to speak of consumption patterns and life styles and waste; to create an understanding in the general public which could help make it less susceptible to glamour appeals; and to attempt to put out of fashion the importance of "newer, faster, bigger" and "more, more, more."

The attempt here would be to develop a real understanding of ecology—a basic acquaintance with the fact that man is just one small part of the natural system with no greater rights than any other growing thing in it, and no rights whatever to intrude in the natural order of things.

An understanding of what it means to live on an island. We would like to see industrial innovations considered guilty until proven innocent, instead of vice versa.

3. The third area of desperately needed avertising funds is the issue-oriented advertising.

When a timber supply act hits Congress, or an Alaska pipeline lobby, someone has got to speak out for the wilderness that has no voice of its own, and if it is to succeed—as the anti-Grand Canyon dam campaign proved it could, for the Sierra Club—it must be done with the same modern tools used by industry to tell everyone everything is going to be all right.

Right now, any conservation organization which does take an ad runs the risk of having done to it what happened to the Sierra Club—losing its tax-deductible status. So, at the moment, even with money, organizations are effectively prevented from stating an alternative point of view.

As I say these things, I am aware that all of my concerns, as voiced in the first half of this paper, are equally or perhaps even more applicable to the administering of educational advertising funds. What if they went to an industrial foundation, for example, making things still worse?

Having said all this, I must also say I have extremely ambiguous feelings about whether or not fundamental educational messages could be employed in a federally financed ad program, or whether the only talk would be about littering and clean air.

Much of an effective program, after all, would be against the behavior of government itself. I will have to live with that ambiguity, I suppose, and hope for the best.

I thought it worth bringing up in any event because any educational program that is not cognizant of advertising spending will be rowing against a very strong tide.

And, I do know that if conservation organizations had at their disposal just one percent of the money industry had for advertising its reassurances, I believe a large part of the country could be educated to understand the difference between ecological messages and what Tom Turner has called "ecopornography." And it could be done now.

Thank you. I am sorry that I didn't cut as much as I had planned to, but I got all excited. [Laughter and applause.]

Mr. Brademas. That is all right.

Mr. Mander. But I read it faster.

Mr. Brademas. It was an excellent statement, Mr. Man-

der. Because Mr. Reid must go to Alcatraz, I believe we will let him ask his questions at this point.

Professional Responsibilities of Advertising

Mr. Reid. Thank you, Mr. Mander, for a very thoughtful statement, for a very coherent summary of your view.

More seriously, I think what you just said made sense. There is no question but that the power companies put out ads urging people to buy more air conditioning and then come along and say that they can't provide the power without increasing the rates. Then the phone company urges everybody to get three phones in their houses and then complains that the rates are inadequate for equipment to handle the phones.

I take it, your suggestion for advertising does make sense because some of the best pollutists are not necessarily the best conservationists.

I would ask you in advertising as to whether you have taken serious steps with your advertisers to urge them to follow your prescription, or whether you urged the local neswpapers not to accept advertising because it does violence to the truth on environment?

Mr. Mander. Well, to answer the second part first, no, I haven't urged local newspapers or other local media not to, although [some people have] begun an effort to do that.

Mr. Reid. How about the association of advertisers? Have they taken any steps—

Mr. Mander. No. I did make a speech to an association of industrial advertisers on this subject at one point, in which I also mentioned that I thought advertising is one of the industries that is going to have a rapidly declining growth rate for all the reasons that I have stated here and I expected these remarks to cause a lot of controversy.

Instead they didn't cause any at all. In fact, people were very bored by them as near as I could tell and there was no [one] taking [them] seriously at all, which discouraged me greatly.

On the other hand, on a more optimistic note, I have had in the last three months over 100 job applications from major executives and extremely talented radio-television production people in the advertising business, willing to take half salaries or one-third salaries, quit their jobs—which are in some cases very, very big jobs—and come to work if we did these ads, if there was the money to run them someplace, and there was a way of countering this campaign.

For that reason I proposed this idea to the Ford Foundation, of an advertising foundation which could deal with these kinds of subjects.

Mr. Reid. Well, I think your suggestions are excellent and I believe that newspapers have a responsibility to make sure that advertising is accurate in the same way that we tried to establish in the federal government's Truth-in-Lending Act.

I hope that you will write explicitly to the newspapers throughout California and urge them to apply the tests that the best newspapers generally do—where the ad is demonstrably true and not deceptive. I would appreciate receiving your letter and hearing from you. I would be appreciative of your response and I would enter this into the *Congressional Record* upon receiving them.

Mr. Mander. I think I will do that and I think I can get a lot of advertising people to go along with that.

Mr. Brademas. Mr. Reid, as some of you are unaware, is the former publisher of the *New York Herald Tribune*, the local journal. [Laughter].

I have several questions following your most interesting paper, Mr. Mander: first of all, with respect to what Mr. Reid was just talking to you about, namely, what are the advertisers in the country doing? Is it really reasonable to expect—in spite of your observation that a number of advertising executives have suggested coming to work for you because of their awareness of your concern about the ecological issue—is it really reasonable to expect that the advertising executives of the land are going to, as it were, turn on their clients? Why should they suddenly begin living as saints rather than sinners?

Mr. Mander. Well, if it is reasonable to say that society is in a crisis situation and everyone is affected equally by what may be the eventual demise of the whole system—if that urgency could be conveyed to the advertising people—I would say it is reasonable to expect that they would react very well, because they are fairly intelligent.

Mr. Brademas. It is not their intelligence, it's their character I am questioning.

Mr. Mander. But in the present state of things, judging by my own bouncing off of the industrial advertisers association, I am prepared to say it is not reasonable to expect much response in the matter.

I didn't get to answering the first part of Mr. Reid's remarks concerning what we are doing with our own clients. I started with the premise that it is possible to persuade your clients to face up to the facts and to turn them around and to get them to really deal with it as they actually perceive it themselves, personally.

I have had only moderate success with that, I will say. I would say we have one or two clients who are at present still engaged in polluting activities, and despite threats of denouncing them publicly, resigning the account and such things as that—which is what we inevitably will do—they haven't come around as well as I hoped and I find it discouraging.

I think it is a slow process and the more we can educate them personally, the better chance we have; but I am not as optimistic about that as I used to be.

Mr. Brademas. Is there, for instance, any effort being made within the trade association of advertisers in the United States—that is advertising, public relations associations—is there any effort to study in a systematic way, the applications of the newly concerned about the environment for the advertising, public relations business in the United States?

In other words, have any of those trade associations put together special committees or study groups to look into this problem for each industry?

Mr. Mander. Well, I would say that industry associations are certainly very, very concerned about this.

Mr. Brademas. No, I mean the—

Mr. Mander. The advertising associations themselves?

Mr. Brademas. Yes.

Mr. Mander. Besides general exhortations to get in-

volved in public problems and the importance of advertising men being involved and sprucing up their image themselves, I would say, no, there hasn't been what I would call a serious recognition by the industry associations and there hasn't been any serious thought, that I have noticed, given to the possibilities that advertising, in fact, may be heading for serious trouble, although there have been a lot of individuals—as I have mentioned, an extraordinary number of individuals—concerned.

Basically, advertising has been tied to the notion of expanding economy and it is practically antithetical to advertising thinking to be considering the possibility of less.

Mr. Brademas. You really touched in your last statement upon my point. I'd take seriously the concern of advertising men about the ecological crisis if I could find that at least they would be willing to get together and consider the development of a set of standards to which they, as advertising men, would be willing to commit themselves before they agree to undertake accounts for their clients and they would say, for instance, "We will not take on an account for a client who pollutes, who does not take into consideration the impact on the environment of their economic activities."

Now, I take it you are telling me that we are nowhere near that stage of adopting standards at this point?

Mr. Mander. Yes. I would say we are nowhere near that.

Educational Advertising

Mr. Brademas. I also was impressed by your statement which is, I take it, fundamental, fundamental to every thing that you said, that any educational program that is not cognizant of advertising spending would be rowing against a very strong tide; I think you are exactly right and I think, moreover, that your plea for the fairness doctrine being applied to industry, the concern about issue-oriented ads and, in particular, your plea that general education advertising help create a real understanding of what we mean by ecology—I think those are very well taken points, Mr. Mander, and I strongly applaud them indeed.

It is the last of those three that I think we had in mind when we wrote into the bill authorization for funds to be used in the preparation of materials for use by the mass media in getting across the concern about the environment. Do you have any more specific suggestions on how that proposed section could be used?

Mr. Mander. I took it by the phrase "mass media" that what was implied in that section of the bill was funds which you say a newspaper could use to investigate, to do investigative reporting or scientific reporting, of one kind or another.

What I am speaking about today is actual advertising, simply because I think the mental set of society in general, as you now have it, reads advertising in a somewhat different mood or frame of mind than it does investigative reporting.

They know that—it is going to be hard for me to articulate this—but I think in some ways they are more willing to accept things that are stated formally in an ad—especially by a so-called do-good organization—as being true and pertinent than, more and more, a greater glut of information in the news columns of which we have had a tremendous amount already.

So I did have in mind a thing, which I don't know is possible, or even achievable or practical, but what I did have in mind was actual funding for conservation organizations eager to take on the possibility of using advertising as an educational form.

Mr. Brademas. Thank you very much. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman. We appreciate your very provocative statement.

Mr. Mander. Thank you.

Controlling Advertising By Taxation

Mr. Hansen. . . . I think you have properly indentified some desirable goals in an attempt to achieve kind of a balance that will at least give the average person some reasonable opportunities to make a value judgment on some of the issues.

I think it is fair to say that it is probably not likely that we are going to be prepared to allocate the kind of resources that you point out that are properly going to be necessary to achieve this kind of basic fairness.

So let me ask for your comment on another technique that I have not heard mentioned. This may be very revolutionary and it probably will bring the wrath down on many of us, but it seems to me it ought to be explored:

Do you think . . . in view of the enormous amounts that are being spent on the kind of advertising that you make reference to . . . now is a good time to examine our tax laws for the purpose of determining some new limitations on the scope of corporate advertising that could qualify as a legitimate business deduction?

Mr. Mander. I think that would be splendid. That is a revolutionary suggestion, one that I subscribe to.

Yes. I think if there could be controls over—I mean if there was some effective way of preventing industry by way of taxing—taxing an advertising budget over a certain amount, let's say, or providing an ombudsman who could tax advertising which is questionable or has the effect of presenting a point of view in society for which it doesn't have an opportunity to defend itself—that we might make the whole competition between the ecology message and the advertising-public relations effort, to soften it, a much more equal effort.

But there is a very immediate kind of tax problem, and I did make a very brief reference in my statement—but not as part of the prepared text—which is that we still have the situation whereby conservation organizations, in fact any other tax deductible organization is effectively prevented from doing this work, which is far more shocking to me than the fact that an industry can present its message.

Industry can present its message and write it off as a business expense, but the Sierra Club or Friends of the Earth or any other conservation organization which wishes to oppose some project seriously, if it involves legislation in any way at all, runs the very serious risk of finding itself out of business because we may be violating the IRS conditions against tax-deductible organizations spending a lot of money on influencing legislation.

So industry can find it easy to be lobbying or influenc-

ing legislation, whereas organizations which are only set up for the public good and have no motive or desire to make a gain out of it, are effectively and very definitely prevented from doing it.

The Sierra Club was seriously hampered by that action and Friends of the Earth, which was formed as an activist conservation organization, set itself up without a tax deduction deliberately so that it could take on public questions but, as a result, it prevented a tremendous amount of donation money from coming in so that in a way the organizations acting in the public interest have two strikes against them as they start, because the fact that they don't have any money to do the message bit.

So I would. I agree entirely with your suggestion. I think I would like to study that, in fact, and maybe even propose some possible solution to what you are outlining.

If industry would be prevented from writing as a deduction, if P.G.&E. could not write as an advertising deduction, its ads trying to sell the public on nuclear power as a nonpolluting power source, it might not do quite so many and it might be easier to have an equal argument about the merits of the issue as it actually is. . . .

Simplicity versus Technology

Mr. Hansen. Thank you very much.

Mr. Brademas. Mr. Mander, I just have one other question, and this is—I was struck in your testimony by several references to what I took to be in your own mind an earlier happier time when people lived in the forests and simple subsistence economies on the Micronesian Islands or Alaska in igloos, and I have just two questions here.

One is, while I am sympathetic to your suggestion that we ought to consider in systematic ways the impact on the environment of various forms of intervention—and one witness suggested that we might set up ecological models by using an island, and others suggested that you could harness a computer in which you could put in variables and then you could make an intelligent judgment of what would be the impact ecologically on a variety of forms of intervention—but I am only expressing the hope that you are not suggesting it is really possible for us to return to some state of nature where there is joyous dancing in the wheat fields and progressive kindergartens. Although that would be very pleasant, is that really possible at this stage of the game?

You understand the thrust of my question I take it?

Mr. Mander. No. I think it is not possible under the conditions at the moment. I myself am not a Luddite although what I am interested in doing is making sure the Luddites have a say, simply because there is tremendous truth in the fact that there are other levels of satisfaction in the world beyond acquisition of material wealth and continuing devotion to economic and technological growth. But I am also interested in articulating, in as extreme a way as possible—simply because it doesn't get articulated often enough—the notion that growth and technological development and absolute commitment to technology as a solution of problems is simply an inaccurate way of proceeding.

There may be a technological solution to one problem or another—I know Stewart Brand, I think, will have to say something about that. But I think it can be established that growth as a panacea—growth in an economic society, based on economic growth as something of an absolute, God-given, organic process that people need to respond to—is nonsense, in my judgment, is not at all required.

As we see by looking at others, the Micronesian islanders whom I spent some time with, I find their lives extremely satisfying, and the notion of expansion and growth is literally meaningless and of no importance.

So I am mainly interested in undermining the commitment to growth as any kind of a reasonable goal at all.

Mr. Brademas. Well, I appreciate that. I thoroughly agree with you. I think I am right in saying that it was the distinguished scientist from California, Dr. Murray Gellman, who won the Nobel Prize a few months ago, who said something to the effect that the mark of a truly civilized society it is capacity to forego undertaking enterprises of which it is technologically capable. [Applause.]

Mr. Mander. Like the SST. I think the phrase is "guilty until proven innocent."

Mr. Brademas. Well, thank you very much for coming, sir, and I hope you will let us be in touch with you further.

Mr. Mander. By all means.

Introduction of Stewart Brand, Editor of the Whole Earth Catalog

Mr. Brademas. Our final witness in our morning session is Mr. Stewart Brand who edits and publishes the *Whole Earth Catalog*.

Now, Mr. Brand, we are glad to see you. We are aware of your catalog. We read about you in the powerful *New York Times* and we are glad to welcome you.

Mr. Brand. My statement is brief. I am delighted by the spirit behind your Environmental Quality Education Act, H.R. 14753, and depressed by every measure in it.

The Hazards of Federal Aid

I am a former ecology student and I can report that ecology as a science is pretty boring. Definitely not for everyone.

Ecology as a movement, as a religion, is tremendously exciting and everyone can get a piece of the fervor. However, this voluntary mass education could be poisoned by federal help, as highly-intentioned, overspecialized application of fertilizers and pesticides has damaged other natural growth processes.

In my experience the whole apparatus of application, approval, and funding commonly introduces a dishonesty into an operation that can never be eradicated; and if the operation is educational, dishonesty is the death of it.

I see that the bill provides for preparing information specifically for mass media use. Involvement of government with mass communications in this manner strikes me as dangerous as rejoining church and state.

If federal funds are to be spent on environmental matters, let them go to:

1. The space program, which has given us the anti-environmental prespective to see our planet whole and alive and in hazard.

2. The World Game of Buckminster Fuller's. This computer operation is planned to perform for the earth as NASA computers did for Apollo 13—inventory resources, assess damage, compare alternative futures, select the most promising, constantly.

3. Contingency planning for environmental disasters comparable to long-range planning in the military.

4. A wet NASA to investigate the sea and treat it like Antarctica, as a fragile, transnational environment. Use of the oceans must be governed from a strictly environmental standpoint by an international body with a great deal more power to act than the U.N. has.

5. Rehabilitation for ecological disaster areas such as Lake Erie and the Appalachian strip mine country.

6. Ecology action type groups, but only for services rendered. Do not fund them, do not tax them, do not pass laws about them. When they perform a service to government such as investigation of environmental crimes, pay them for the information.

7. Follow-up reports by independent groups of federal actions affecting the environment. Do this as a built-in part of initial funding. Appropriations for a dam or a war would include money to go to the National Science Foundation or the Audubon Society or whoever to study the environmental effects of the project and report on them.

I realize that practically none of the above are the province of the Education Subcommittee. John Holt has suggested that if we tried to teach infants to talk, they would never learn. I suspect it is the same with ecology. It must be learned—it is being learned. If you try to teach it to people you will only teach them to hate it. Let it be. [Applause.]

The Hazards of Private Enterprise

Mr. Brademas. Thank you very much. I am delighted by the spirit behind your testimony and depressed by every sentence in it. [Laughter.] Because, if I read you right, you really want to leave things to industry to pollute and I don't think that is really what you had in mind.

For example, you say that you don't want the government involved with mass communications . . . in the manner which this bill might make possible. . . .

Now, if one were to take that superduper free enterprise attitude which your testimony suggests, you would leave the mass media in this country still more under the powerful economic control of the industries that pollute.

I would remind you that it is only because of the imposition of the fairness doctrine by the Federal Communications Commission that we now find some spot commercials on television in this country that attack cigarette smoking as being injurious to health, whereas prior to that the cigarette manufacturers had a complete monopoly.

Now, I cite this only as one instance in which, I think, your readily colorful rhetoric is dangerous. You don't really mean that, do you? Do you understand my point?

Mr. Brand. I believe so and I am not sure that fairness doctrine hurts the right guy. By insisting that networks, for example, give equal time to, you know, the other ads, we will say, who gets hurt is most directly the networks because they are the guys who lose some of their time.

Mr. Brademas. That doesn't upset you, does it?

Mr. Brand. I don't know. This whole question of the relationship of communication system and government is the hottest one going. This will be going for years.

Mr. Brademas. I am not quarreling with you about that, but I am trying to pin you down as to your implications on your contention that, I take, you are saying, just let the networks and manufacturers and advertising agencies have control of the whole shebang; who is speaking up for the public interest?

Mr. Brand. Well, the public can speak for itself.

Mr. Brademas. Who speaks up for the public interest?

Mr. Brand. Well, you see, I am just trying to be as useful a witness as I can. [This is] the first operational experience that I have had. I learned a lot of stuff in the schools and then had to go to unlearn it and relearn it my way so that I can feel good with it.

That's happened with ecology; it has happened in other things. The other operational experience I have had is that all too often federal funds have come in as kind of a poison from on high or afar into the local operation where they don't bear real relation to the local situation. And this dishonesty bit—boy, you lose every time.

Jerry's point on the taxation question is a good one. The first one to apply for exemption would be the big companies with the pollution ads.

Mr. Brademas. Well, I hear what you are saying and I don't think that I am in disagreement with the spirit that motivates you, but I think—and we are just, each of us, expressing our own judgment here—that the implications of your statement, if taken seriously, . . . would be welcomed with open arms by the polluting industry.

. . . I take it from your statement here that you don't want . . . the federal government—either through the FCC in the case that we have been talking about, or through encouraging education about the whole spectrum of environmental issues—to be involved.

Now, we have had witnesses testify here this morning—you have heard them—warning and showing instances on how a polluting industry won't hesitate for a minute to put millions, hundreds of millions of dollars into advertising to get its point of view across and to suggest that the polluting industry is doing a splendid job of coping with pollution.

Now, the purpose of the legislation we are considering is at least to be able, in a modest way, to begin educating people about some of the dangers of pollution and other attacks upon the environment. So I am not quite sure that I appreciate the thrust of your testimony.

. . . I agree with your vibrations but not with your prescriptions. We are very grateful to you. [Applause.]

We are very grateful to Mr. Brand and to all of our other witnesses this morning and we are going to adjourn now for a little over an hour before we return around 2:30 for the student-faculty panel. The subcommittee is adjourned.

(The hearing adjourned at 1:30 to be resumed at 2:30 p.m.)

DAY 12

AFTERNOON

House of Representatives, Select Subcommittee on Education
San Francisco, California

May 1, 1970

The afternoon session of the San Francisco hearings consisted of testimony from a panel of students and faculty from the University of California at Berkeley.

Dr. Arnold Schultz, professor of forestry and conservation, was the opening witness. He contrasted the idea of "ecosystems management" with "environmental control." He defined "environment" as everything *which is outside a man's skin. In this sense, "environment" is much too broad a concept with which to work; the concept "ecosystem" is much more limited and useful. He decried the tendency to view the environment as an ideal state which has been befouled by man. The environment is, rather, a set of constraints within which man must operate. Hence, it is never a question of* controlling *the* environment, *but instead, a matter of* managing *(working with the constraints imposed by environment)* ecosystems *(limited portions of the total* environment*).*

"Who should educate whom regarding what?" was the question posed by James Pepper, a graduate student in landscape architecture. Pepper's answer was that the "guilty" are the ones who must be educated. It is not "the public" who are to blame for the state of the environment. It is the leaders themselves, both governmental and corporate, who have failed to forestall environmental deterioration. Though it has had many opportunities to do so in the past, Congress has consistently failed to pass laws regulating the environmentally detrimental activities of industry. Thus, it is perhaps Congress, most of all, which needs educating.

Pepper and Ruthann Corwin, a student of philosophy and physiology, both made a number of specific suggestions for improving the bill by adding clearer guidelines for its implementors to follow. Pepper recommended more precise delineation of the standards of commitment to be met by recipients of funds and the kinds of programs to be funded. Corwin suggested that, in order to guide the implementors, the bill should indicate models of types of programs to be funded; she described three interdisciplinary models with which she was familiar. She also stressed the importance of funding programs of "less structured" groups, even though it is more difficult to assure follow-through and results from these groups.

Michael Scriven, professor of philosophy, drew on his academic experience as a moral philosopher as well as his practical experience with the problems of precollegiate education to make two major points. His first was that we can not have environmental education without getting into "hot" political and moral questions—which many communities and schools are reticent to do. There are two prerequisites to intelligent handling of moral problems: we must learn to clarify the moral issues and then to recognize and manage moral conflicts through open consideration of the implications of various value positions. Our schools have prepared citizens very poorly to do either of those things. Scriven's second major point concerned the practical problems of implementing environmental education programs on a broad scale. He pointed out that good, complex ideas are not easily diffused to others unless they are "packaged" in some concrete, easily transportable form. Thus, the development of materials *for environmental education is extremely important if nationwide impact is the goal.*

Mr. Brademas. The subcommittee will resume consideration of H.R. 14753 this afternoon.

We shall have a panel discussion of the witnesses who have been scheduled: Dr. Arnold Schultz, professor of forestry and conservation, University of California in Berkeley; Dr. Michael Scriven, professor of philosophy at the same university; James Pepper, a graduate student at the department of landscape architecture, and Ruth Corwin, an undergraduate student, also of Berkeley.

The Chair would like to suggest that these witnesses be kind enough to come forward and take seats and that, if each of them will be good enough to summarize his prepared statement—the entire text of the prepared statements will be inserted as if read in the hearings—and that procedure, I think, will afford us more opportunity to put questions to you. Unless there is some other order of testimony, we can begin with Dr. Schultz.

Who is Dr. Schultz—you, sir? Then, I take it Dr. Scriven is not yet here?

Dr. Schultz. No.

Mr. Brademas. Mr. Pepper?

Mr. Pepper. Yes.

Mr. Brademas. And Miss Corwin?

Miss Corwin. Yes.

Mr. Brademas. Would that be satisfactory?

Dr. Schultz. Very good.

Mr. Brademas. Dr. Schultz, if you would go ahead, sir, and, as I suggested, if you could summarize for us your statement because we have your statement and we can read it as you move along.

Introduction of Arnold Schultz, Ecologist and Professor of Forestry

Dr. Schultz. Very good. Thank you, Mr. Chairman.

I am an ecologist. I have been a practicing ecologist—teaching, research and consulting—for 30 years. Some of my later remarks will reflect this background. I think Mr. Brand, who talked about being bored by ecology, didn't, of course, take a course from me. [Laughter.]

I have a bachelor's degree in zoology from the University of Minnesota and a master of science degree in ecology, also from Minnesota, and my Ph.D. was in plant ecology from the University of Nebraska. . . .

My research has been on both sides of the environmental quality issue. In the early years I studied fire and chemical, biological and mechanical methods of manipulating vegetation. Since 1958 I have been studying entire ecosystems—the arctic tundra, the coastal pygmy forest and high mountain meadows.

Now, not to continue on with more of my qualifications but rather to indicate some of the things that we have already started at Berkeley in the way of environmental quality education; one of these things that I have been involved in since 1964, I have taught a course—a graduate level course—which is called natural resource ecosystem, but I prefer to call it ecosystemology. And this was the first course of its kind in the United States.

Now, one of the students that took my first class was Garrett De Bell and I have perhaps the first handbook, *The Environmental Handbook*, that came off the press. The handbook was edited by Garrett. . . .

In 1969, just last fall, I initiated and taught another new course, this time for undergraduates. This is the popular interdepartmental study course entitled "Man and His Environment—Crises and Conflicts." It has had up to 525 students per quarter, from freshmen to graduates, and represented by nearly every discipline on campus. . . .

Now, I would like to make some brief comments on the bill. If this bill passes, it will serve an excellent purpose. However, as it is now written, I see a number of weak emphases and fuzzy thoughts which, if not modified, may ultimately get the whole program off on the wrong foot.

The Necessity of Management

I shall outline [several points] here. . . . First of all, the focus on management: to achieve or maintain any desired quality of environment, control or regulation must be affected. This requires knowledge about management. But environment itself cannot be managed, only systems can be managed—in this case the ecosystem.

The idea is that "environment" is too vague a term and one reason why environmental quality has deteriorated in the last half century is that the science which deals with environment—namely ecology—has traditionally abhorred the idea of management. However, if you think about it, any time you take some overt action to correct something or to do something, it is management; and the ecologists and the "balance of nature" people in the past and even Earth Day people of the present think in terms of "leave it alone," but we know now that we just cannot leave it alone.

In fact, to leave it alone is a form of management—if we think in terms of management—no matter how objectionable the term may be to us. I think this would be at least pedagogically preferable to a term "environment" which now is a vague term.

I put the ecologists' word or term "balance of nature" in the same category as the economist's "free competitive market." The physicist has an analogous construct which sums them all up perfectly: "the perfect gas." [Laughter.]

Today's rhetoric perpetuates the notion of "environment" as an ideal, which because of man's activity is becoming less and less so. I think it better to consider environment the other way around—as a constraint to man's activity.

Now, I am not suggesting that the words be changed in the bill to accommodate this philosophy. I realize that environment and ecological balance are now ordinary concepts, useful for conveying the general concern. But as scientific or managerial concepts around which to develop sound education programs they are horribly deficient and completely inappropriate.

Delimiting Controlled and Uncontrolled Environments

Now, as to environment, my reason for defining environment as a constraint, rather than something that should be managed or controlled or something that is out there deteriorating because of man's activity, [is that] everything

. . . from man's skin on out is environment. This is all environment and the farthest reaches of the universe cannot possibly be controlled. We can't do anything about it—in fact, we don't want to, we don't worry about it—but there is some point between man's skin and a distance from there that we think in terms of "our system," "our ecosystem" or home or whatever you want to call it—our immediate environment, we call it—and this is what needs to be managed, this is what we are concerned about and all that [is] outside of that . . . boundary is what truly should be called environment. This is something that we do not need to control.

So that part that is measured right at the certain boundary of a system is actually a constraint, or a given, a fixed constraint under which we have to act and this is about the only feasible way I know of how to handle the problem and to formulate it into a framework which can be put across at any level.

I haven't tried it at the elementary level, but I think perhaps it can be done there, too.

So this puts more emphasis on ecosystem itself than on environment. Some of the testimony this morning also brought in that same concept of the ecosystem.

Systems and Purpose

The greatest advantage in packing conceptually all the manipulate things into the ecosystem is this:

Now all the tools and strategies of systems analysis can be brought into play. Such methods as simulation, operations research, decision and game theory, network and flow theory, topology and others are powerful and have found application in many fields— . . . in business administration, economics, architecture, and elsewhere. So these methods are likewise appropriate for studying and managing ecosystems.

A system is an organization with a purpose. This relates the system to some larger system—the ecosystem we are talking about—and it should be recognized that the earth is polluted as it is because science and technology were obsessed with mechanisms—finding out why things happened—without a thought of goals.

The "what for" questions were not deemed worthy of science and the schools perpetuated the blunder.

So in all our sciences we have been thinking in terms of mechanisms—what makes things tick—and we haven't ever asked the question of what for, which has always been relegated to poets and philosophers.

So the philosophy of holism, along with system study, both synthesis and analysis, are necessary components of the educational programs that ought to be envisaged by this bill.

The Nature of Nature

Now, another thing that bothered me is the way environment and science and nature are thought of.

Nature to me is what exists right now. It includes the oil rig platforms in Santa Barbara Channel, the Delta-Mendota Canal and Lake Erie in its present splendor. The strategy of natural science is mostly analysis; its output is descriptive and it records invariants among all observed events and states them as natural laws.

It doesn't make any difference, really, whether the agent, the active agent initiating a process, is the wind, which we can't do anything about, or if it is man who does something by accident or man who does something by willful design. . . . [S]o what exists now is nature; otherwise we get into trouble figuring out how far back we have to go before we even can find nature.

Artificial science is concerned with what ought to be. Goals and purposes are involved. The strategy of the artificial sciences is mostly synthesis. Synthesis is involved in design, management, policy formulation, in creative work, and in all decision-making. Artificial sciences include engineering, law, architecture, business administration, education. I think of ecosystem management as an artificial science. I think of ecosystem management as a profession which we must develop.

So ecology is a natural science to the extent that it describes the system as it is under the constraints of all natural laws. But no one, least of all the ecologist, is satisfied with the world as it is. It must be changed to something else—to what existed in earlier times, to tolerable limits, to a more conservative use and so on.

Even when we are satisfied with the present state, we choose to apply some overt action to keep it that way and this is management. Anyway you want to slice it, this is an artificial science.

So I think we have a hangup here on this distinction between artificial and natural sciences in the way we teach ecology, in the way we teach environmental sciences, whatever you want to call it.

The Need for and Practicality of Generalists

Now I want to say a word about multi- versus inter- versus intra-disciplinary studies.

The word "interdisciplinary" is sort of an "in" thing in education today and there are several ways in which this can be brought about.

One way would be—this is in education now, I am not talking about interdisciplinary research—in practice this means to get people from various disciplines together to teach their particular bag of ideas to the same student. Professors sometimes get together the idea beforehand and bring these ideas from the separate specialities into an integrated package and subject the student to it.

More often they individually toss the specialty concepts up into the air, and as they come down, the student grabs an armful of confetti and does the integrating himself.

This is not a caricature. This is the way, the only way we can think at present about the interdisciplinary approach. It takes a new language common to all disciplines before the real goal is effected. The real goal is the production of a multidisciplinarian, a person who can handle competently more than one discipline.

Now, this brings up the argument about the generalist and the specialist. There would be no argument except that we go to school with the aspirations of becoming specialists. I think it has been with us for centuries.

The question every grade school or high school student asks himself at some time is "What do I want to be?" If he turns out to be a generalist, this is simply because he

could not make up his mind about what course to pursue. Our educated society has built up a stigma against this. Employers, while they like people who know something about everything, nevertheless use expertise as a criterion for hiring.

So even environmental quality education must take these matters into account. Obviously we need some generalists. At elementary and high school levels, students have not yet put the blinders on. So unlearning does not have to be done. The problem really is, first, in training the teachers who are in charge of the school programs and, one step further back, in training the organizers of the teacher training programs.

At step two is where we desperately need multidisciplinarians, people with a holistic philosophy who are not convinced that all can be solved with technology nor convinced that all can be solved with political action.

Specialists are for the most part too hungup with intradiscipline loyalties, too immersed in their own language, too narrow in their outlook to be helpful in organizing a training program. This is evidenced by the difficulties we have at Berkeley in developing a broad-gauged graduate program.

So my conclusion is that we have really very few people who at the outset can put such a program together or can properly evaluate project proposals—and . . . the idea of specialists specializing or making a single discipline out of environmental science is folly. I have a little different way of looking at that.

I think that we can turn out specialists in generalizations; in other words, people who do generalize but specialize in it; in other words, they are trained to generalize rather than just happen to take a potpourri of courses and become generalists.

An Unorthodox View of Curriculum Building

Then there is one final point that I want to make and that is the relationship of the environmental quality education to other curricula.

As I said in my preliminary remarks, there is a possibility that this—the education program resulting from this—might be just thought of as being added on or stuck into the school curriculum; but I think it has to go further than that, mainly because I visualize that the generalists' training will have to leave out some things.

For example, a student wants to be a biologist. At present he has to take chemistry before he can become a biologist; maybe he has to take some physics before he can take a course in chemistry.

This is the building-block method, where you have to take some of the things at the lower level of organization before you can understand those above. I think this is wrong.

It seems to me that what we should do is start at the perceptive level, simply what objects and relations we apprehend.

Then if we need an explanation, that is, if we are interested in mechanisms—that is, if we are interested in mechanisms or inward-directed phenomena—we can take the time to drop down one level and go to chemistry or to physics, if necessary, or to nuclear particles, but we should go down no further than is necessary to give the explanation we want.

This gives more time for studying outward-directed relationships from biological subsystems to the political and economic and social subactivities.

So it is conceivable that a thorough education program addressed to environmental quality could alter some basic precepts such as the building block one. I would prefer to say "should" rather than "could."

Another thing that would be affected is rigor. There are two opposing views. We can't really have a good outgoing generalist program without sacrificing some of the rigor. I don't know whether you need to worry too much about rigor or put too much emphasis on it, but the two things don't go together too well; however, it may be formulated at a certain level of organization and we can talk about this with suitable rigor. I think that sums it up pretty well.

Mr. Brademas. Thank you very much, Dr. Schultz.

Introduction of James Pepper, Graduate Student in Landscape Architecture

I think we will next call on Mr. Pepper and put the questions to all of you together.

Mr. Pepper. I see the problem as who should educate whom regarding what. I think the first half of my paper, which addresses the source of the problem, is vital to how we go about answering it. I will try to summarize, as briefly as I can, the points contained in this portion of my paper.

Who Is Guilty?

The first point that I feel must be straightened out relates to who is to blame: who is to really be educated regarding inadequacies that have brought about the so-called environmental crisis.

I notice today that legislation and governmental and industrial publications address the public as being the guilty party. I believe this is the height of hypocrisy, and that along with addressing the public, the leadership of both government and industry must assume their responsibility. I should even hope that this could appear in the legislation specifically, because leadership is certainly a major part of the problem.

My second point addresses environmental legislation. For the past decade I have become familiar with the legislation that has been proposed regarding ecological inventories, environmental management, and general environmental matters; they have all been defeated, which to me means that the Congress itself is sorely in need of education.

This problem is not a new one. This has been questioned since the '20s. As I recall, at the UNESCO conference in San Francisco last December, LaMont Cole, an ecologist, produced a document that originated with the Ford Motor Company in the twenties saying that they would not market a pollution-free internal combustion engine until government made them.

As far as I am concerned there are two guilty parties—government and corporate leadership.

Some Requirements for Environmental Education

Lynton Caldwell, a professor of government from Congressman Brademas' home state, prepared an excellent paper for that UNESCO conference, addressing the subject of governmental organizational adequacy for managing the environment. I trust that this is environmental education.

Environmental problems are not the result of malfunction of natural ecosystems, but are the impact of the limited objectives of our own social, economic, and political policies. Environmental education is not a simple matter. It not only requires a functional knowledge of natural and social systems, but also the very difficult and emotionally charged area of intentional cultural change. To be effective in this area will not be easy, but this, too, is environmental education.

Now, I believe this has been the one point which has been overlooked in the testimony that I heard this morning, and that is, that it is the people that are going to have to change the cultural system. The natural system continues "doing its own thing."

If we are not prepared to accept the challenge to assure a qualitative future for our species we are sorely missing the boat.

To develop a theme of Professor Schultz a little further, environment is everything that is outside or external to the organism or object of study. Education directed at this phenomenon would necessarily be holistic or all encompassing in its subject matter.

This presents a dichotomy in the present form of education. This holistic education cannot be taught using the techniques of the present specialists or compartmentalists and by that very nature, our present education is unintentionally antienvironmental. Adding new curriculums is not the solution. I am sure that a total revolution in education, and nothing less, will be required to achieve environmental quality.

Now let me address my remarks specifically to the provisions of your legislation. I will read from this point on and make your job, Mr. Reporter, a little easier.

I am a proponent of environmental education and endorse the legislation in question, but with both general and specific criticism. Much of this bill is vague—perhaps legislative language has this characteristic, but for an informed public the bill is simply too unspecific. In some respects it is also misleading.

Frequent use is made of the phrase:

> . . . to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

Even if the terms "environment" and "ecology" have serious limitations for any functional policy, it will undoubtedly have to suffice for want of more appropriate and accepted terms. Perhaps Dr. Schultz's ecosystemology is the concept to discuss.

Recommendations on Grant-making

Now to specific criticism: my first specific criticism of the provisions concerns the description of eligible grantees as set forth in section 3, item 1. The description reads as follows:

> Institutes of higher education and other public or private agencies, institutions or organizations.

Now, this appears to me to exclude no one. In order to avoid pork barreling, this bill must limit grants to specific areas of endeavor. I favor grant-funding priorities be given to persons and organizations who have previously been involved in the commitment to interdisciplinary study and research and to people who presently have a commitment to meaningful environmental education.

And a word of caution: large research organizations and major educational institutions will find it hard to resist the temptation of "environmentaling up" old research proposals with the addition of a social scientist or "environmental somethingist."

I think it is imperative that this is understood and that, if the legislation is passed, the grant selection committee must be aware of this.

Furthermore, these institutions absorb capital all too easily. I understand that you undoubtedly will have limited capital to begin with and I would suggest places that could generate programs rather than be swallowed in ratholes of present research funding.

Therefore, I propose that grants should favor student and citizen-initiated projects and elementary and secondary education programs which are multidisciplinary and problem solving in structure.

I think the insertion of "problem solving" is imperative someplace within the legislation so we are no longer addressing ourselves to some abstract, but some operational-functional concept that Dr. Schultz has alluded to.

Special attention should be given to interdisciplinary Ph.D. students who will provide us with sorely needed environmental generalists or managers.

I would like to add another comment regarding grantees. I think I would find myself unable to endorse legislation that permitted funds to go to corporate enterprises that presently are spending five times as much money for advertising as they are for research and developmnt. Government would be extremely guilty of misuse of taxpayers' money if this were carried out.

Educating Congress and the Public

The provision of section 3, item 4, stressing adult education especially impresses me. I should like to add that we might start with an adult environmental education workshop for the members of Congress and especially for the administration.

This workshop would serve not only to indicate their seriousness regarding environmental matters, but if these sessions were carried on mass media, the uninformed public could receive the dual benefit of their own education and a realistic assessment of the knowledgeability of their elected representatives.

Perhaps this is an unattainable dream of mine, but this might be the feedback that is needed to bring the system into balance.

The provision of section 3, item 5, which deals with the use of mass media for environmental education is the best provision of the legislation if—and perhaps a big "if" —and only if, the content chosen is compatible with the magnitude of the problem.

I believe that in testimony this morning, especially Mr. Brand's, concern over governmental intervention in media was discussed. I share the uneasiness in this matter, and I would caution you that, if mass media are used, let it be significant—a significant mass media campaign.

A mass media public relations campaign of environmental enhancement would push us over the brink. Education implies the assimilation of new concepts or ideas, not the reinforcement of presently held beliefs.

Another important point is, that you may have to develop programs that may make it tough for some present institutions to survive. I am not specifically addressing this to government or industry, but our institutions must become flexible because the natural systems that we operate within just don't have the resilience to sustain our present cultural institutions.

Composition of the Advisory Committee

My second specific criticism—it sounds like I have a lot of them—deals with the all-important advisory committee as per the provisions of section 5, item 5(b).

The composition of this committee will determine the success and effectiveness of the legislation more than any other single factor. The present legislation calls for a 22-member advisory committee. This figure appears to be too generous and I believe that a dozen well-qualified citizens would be sufficient to conduct the serious business outlined in the legislation.

The composition of this committee is critical and simply cannot be a who's who on the administration's list of benevolent good guys, a trend that I believe should be halted immediately, and I, personally, see no need for a Rockefeller, a grand social matron or a Nobel laureate on this commission. This is what was alluded to in testimony this morning, and I concur that the era of patronage must pass.

I believe that membership encompassing [a] natural and social scientist, political economist, citizen environmental activist, student and educator, . . . representing primary and secondary and higher education, . . . would in my mind, provide the necessary balance for such a committee.

All members should be selected not on the basis of their area of specialization but for an overview or holistic perspective in their respective field or area of concern. There is simply nothing worse than getting highly specialized people together to talk about something general.

Evaluation Procedures

I am also extremely interested in an interpretation of the provisions of section 5, item 5(a). The provision to "evaluate programs and projects carried out under this act and disseminate the results of such evaluations" does not specify to whom the evaluation will be disseminated and how or in what form this is to be done. In the interests of an informed public, why not present the evaluation to the public through the use of mass media as proposed in the legislation. A public informed on the results of its investments would be in a far better position to support or reject policy.

The Scope of Environmental Education

A final criticism is directed at the failure of the act to provide even a vague definition of environmental education. Without a general statement regarding the congressional interpretation of environmental education, great problems could easily arise.

Learning how to operate a spacecraft is certainly environmental education. I believe you must be explicit or we will end up with still another NASA subsidiary. This we can do without.

The environment I have addressed my comments to is the environment of this planet—the environment which did not and never should require its most advanced species to wear artificial breathing apparatus or consume enormous quantities of corrective chemicals in order to survive biologically.

In closing, I must remind you that extensive environmental education for this country is a tall order. It is not just another field of study but indeed may be our only hope for survival. It will require a fundamental change in the American ethic.

We can no longer afford to accommodate only ourselves. Professor Scriven, in an excellent paper he prepared for the UNESCO conference, warns us, and I quote:

> We are about to enter a rather dangerous phase in the development of environmental education. It is about to become fashionable.

Thank you very much.

Mr. Brademas. Thank you very much.

Introduction of Ruthann Corwin, Philosophy and Physiology Student

Mr. Brademas. Miss Ruthann Corwin.

Miss Corwin. I am a little disappointed in the fact that there are only two of you here because it seems that much of the testimony that you have been hearing this morning could be learned from a great deal as to all people commenting on what they think and—

Mr. Brademas. We can't be every place. That is part of our problem.

Miss Corwin. I know; yes.

I wrote some very specific suggestions on different sections and so forth. I realize that one thing I neglected to do is put down all my credentials to make this official and so forth.

I will mention that I have a B.A. in philosophy from Berkeley--because I am listed as an undergraduate—but a B.A. in philosophy and a B.A. in physiology coming up next month and I am a member of the Department of the Interior SCOPE Council and I have been getting a lot of interesting feedback on what the government is doing.

At Berkeley I have been involved in faculty-student

committees to try to form a graduate environmental program and I am on the graduate student committee. . . .

Education of the General Public and of Policy-makers

One question that comes to mind in analysis of this bill is that of the goal of environmental quality education that we have in mind. One goal is clearly spelled out in section 2 (a) and (b)—that of educating citizens and school children to the understanding of policies and support of activities.

Another goal that the framers of this legislation might want to include is that of educating people who can draft the policies and initiate the activities, that is, truly interdisciplinary people with a profound understanding of the interrelationships of many fields and sufficient expertise to appreciate the material of these fields in order to be able to come up with solutions to the complex environmental problems.

We have very few of these people in the world today, and the nature of our educational system is not designed to produce a well-educated generalist. It is not enough to train the educators; we must have a way that those who teach the teachers can obtain the education that we think is necessary.

Criteria for Good Environmental Education Programs

I consider that a true environmental education should be aimed at the vision to see the world as a whole and all facets of a problem in their relation to each other, and the ability to work cooperatively with others.

In a world of limited resources, as we are coming to appreciate, we will have to learn to work with each other to establish equitable distributions, or we will perish fighting over scarce goods. Also with the complexity of environmental problems, one person cannot know all, and must work together with others to get complete understanding of a situation.

With these I would include the values of flexibility in being willing to try new approaches and honesty in admitting one's lack of knowledge. It is crucial to our survival that no one pretend that he has information which he does not, and that no one be so ego-involved with any one course of action that he cannot abandon it for a better one.

The holistic approach and the above values of cooperation, flexibility, and honesty can be embodied in traditional elements of education such as the ability to define problems and the boundaries of our knowledge, to evaluate facts and deal with value judgments in order to come to decisions, and to decide on methods by which decisions can be implemented, but we must add the dimension of an appreciation of the knowledge of many fields, so that one understands the social and technical possibilities, with deeper experience of one specific subject in order to understand the problems of research and the reliability of data.

The last element of education I will mention is also crucial to a true environmental education, for it makes obvious the world with which one has to deal, and that would be the experience of implementing a decision that one has made, and of evaluating one's effectiveness.

I would suggest that the above elements of education, especially those that are not now emphasized in education, be criteria for the evaluation of projects to be granted funds under this bill. I do not believe the bill is specific enough, and I am concerned that without guidelines of this sort, funding will go to traditional programs without sufficient emphasis on the interdisciplinary approach and the necessary values and experience.

Holistic Approaches to Education

For example, all school education from primary to graduate might be given grants for those programs which eliminated the traditional curricular approach of dividing knowledge into specific subjects when teaching general knowledge. This might cover all of primary and most of secondary education, and most survey, core, and introductory courses in college.

The approach we have grown up under, in which we had English, history, math, social studies, science, and so forth, is antithetical to the holistic spirit of environmental education in which we must learn the relations of all knowledge. A unified approach might have the added benefit of solving the problems of alienation and lack of relevancy which students complain of, if students know how each bit of knowledge is related to the next and learn topics with a framework that allows them to see each subject in context of its application.

I am tempted to insert a digression on why I never learned trigonometry until very recently, that is, when I discovered I needed it—but I am sure everyone of us can come up with examples of that sort.

A few examples of unifying approaches: one is the Tussman idea, tried at Berkeley, where students study one topic, such as a period in history, from the points of view of all relevant disciplines. This is not environmentally oriented, but the idea is sound.

Another example is the education of Horatio in the novel *The Empire City* by Paul Goodman, where the precocious hero wanders around the city of New York learning to read from the newspapers and gaining all the knowledge of the city—economics, psychology, trades, physical environment, social structures, and so forth—through observation and interaction with the people of the city, even choosing for himself teachers in characters whom he wishes to emulate. Later in the book, one of Horatio's teachers describes a regular program of education of this sort:

> A school where you never go into a school. There's no building, no special subjects to learn and no teacher. . . . You see, if from the beginning they put you in a building and separate you from the world you are supposed to study, then they have to bring the things back inside again and that's the teacher; and since he can't bring it all in, he makes a convenient selection, and those are the subjects.

Supposing you don't start that way—a few pages on he throws in a teacher and a few principles and a thousand and one lesson plans "in order that the teachers may have a storehouse of ideas to draw from. Now the way to get

that is to experiment with a pilot group . . . but there's a sample to give you the taste."

I'd like to read them all because they are quite marvelous, but I'll just read one fragment:

> May fifth. Going uptown we start out early with a game of subway tag. Subway tag is a game where three try to catch three on the trains and stations. They can get off anywhere and ride two stations north or one south. (Special rules for express and local stops.) Let them find out by asking for information where they can cross over between northbound and southbound without paying another fare. The aim is to study the accuracy of such random informants. Who misleads you and why, do you think? How do the trainmen and the passengers put up with such a game when everybody is rather sleepy in the morning? This is the southbound rush hour: Note the sentiment of going against the crowd: Harder? Easier? Size up the train schedules. Play about one hour and arrive at Columbia. . . . A session of mathematics on the sidewalk outside the subway. Statistics of the passerby in different classifications; how many of what will come next? Which predictions were faulty and why?

For the last example, I would like to be able to present a core course proposal that we have been working on for the graduate program in environmental studies at Berkeley, as something that is going to happen. However, the ones I have here are only suggestions, and I must emphasize that, because they are not as complete as they should be and we are still working on getting such a program definitely accepted.

One thing that I would like to point out is that the preliminary recommendation from the students, which includes other environmental education elements than just the core course, calls for one core course which integrates the material proposed to go into several core courses by the faculty. Dr. Schultz, one of my fellow panelists today, presented the unified core course approach entitled "An Alternative 'Core-Course' Proposal."

The student generally feels he has a much better understanding of the needs for a holistic approach than most faculty.

I have chosen the above three examples, the Tussman idea, Paul Goodman's suggestions, and the core course proposal as ideas which I believe embody many of the elements of . . . environmental education, specifically that which deals with an approach which integrates many factors of a single problem. For the section of the bill dealing with school education, I would suggest that guidelines be incorporated that emphasize this sort of project, as opposed to funding courses in ecology to become just another subject in the curriculum.

Informal Education

Although I have left this topic for last, it is not what I consider least important. In fact, I have found from my own experience that education gained outside traditional educational institutions is more relevant, not just for adults, but for schoolchildren and college students—that is why I have tried to suggest broader school programs above, which include actual decision-making and actions, along with an integrated approach to knowledge, which might have the benefit of making education more interesting and less alienated.

I would say that the majority of my educational experience in environmental issues has not come from University of California at Berkeley, but from the Free University of Berkeley, Ecology Action, the Ecology Center, numerous conservation groups including Active Conservation Tactics, the student group at Berkeley, the Sierra Club, and others, and many ad hoc groups, including a great number of my friends.

Aside from the reasons just mentioned on why education outside the traditional institutions appears to be more relevant, I might add for your consideration the thought that the values of working together, of being flexible and honest, cannot be taught very well in a system which places emphasis on competition in the form of grades, degrees, honors, and whatnot, and whose structure leads to the individual getting ahead and achieving security and defending it at the expense of others. This is even more true of industry. I would like to see in the bill language which would exclude grants from going to private profit corporation training programs, but would include definitely nonprofit corporations.

I hope that the bill will incorporate provisions which will make sure that money will go toward these less-structured groups. The suggestion has been made to this committee of a minigrant for these groups. I don't see why, if their ideas are sound enough—that is, embody elements of education like those I discussed before—they can't have maxigrants like any institution.

I would suggest rather, and this is the last time I will use this prefix, miniforms. It has been pointed out to me that the groups that get the money are those who already have at least enough to fund someone to write a grant proposal, which, under the system of pages and pages of forms and itemization down to the last postage stamp, is quite a feat.

I would say, if the program sounds good, fund it, and then keep very close tabs on its progress, and if you are not satisfied that the people are coming up with what they have claimed, take the money away.

Perhaps the difficulty is in the followup, which is why government agencies require such impeccable credentials and detailed forms to get a grant—then they won't have to follow up closely to see whether the money is being misused or not. I would rather see many very experimental and noninstitutionalized groups get the go ahead to try their programs, outlined in sufficient structural and philosophical detail, and then have the money withdrawn from half when they don't come through, than see it all go to traditional institutions where there is very little further contact (annual reports) to see if they are following through, and where the programs might not provide the innovative, interdisciplinary education we would like to see.

Summary: Needed Revisions in Bill

In summary, I will just outline the suggestions I have made above for changes in the bill which I believe will make it more responsive to those trying to achieve true environmental educations:

1. A broad definition of environment to be added for

administrative guideline. Could be included in section 1, after line 4.

2. The addition of section 2 (c) after section 2 (b) on educating environmental generalists—those who will recommend policies and actions, and train the teachers, once they have received an interdisciplinary education. Under "Uses of funds", section 3, add (6), making grants which will fund such educations.

3. The incorporation of some sort of elements of an environmental education guideline to the administrators for the approval of applications, like those which I have suggested, which will make sure that the programs approved will lead to the kind of education we want to encourage. This guideline should probably go under section 4(a)(2) and section 5(a)(3).

4. To go under section 5 as tasks for the advisory committee:

(a) Making changes in the traditional methods of review and deciding on grants so that forms could be simpler.

(b) Setting up methods of following up on programs and taking funding away if necessary, so that the initial funding procedures need not be so stringent.

(c) Making sure that the non-institutional groups can get funded. List prototypes in the bill if need be to assure administrative follow-through: Ecology Action; Ecology Centers; Free Universities; Sierra Club, and other traditional conservation groups; ad hoc environmental groups; ad hoc educational groups.

5. Advisory committee suggestion. . . . my last suggestion. I thought I would pick up what fellow panelists have said, my fellow panelists, and this is that the advisory committee—the nature of the advisory committee in accordance to what I read—this is going to be very important. The people on the committee are going to be very important.

I know from contact and experience that it is the college students now, the undergraduates and graduates who are doing the pushing, at least in most of the schools across the country—they are doing the pushing in getting this kind of a program established and they seem to know the direction as to who they should have and the students should have a say on who goes on the advisory board or they should be on the committee themselves. . . .

Thank you.

Mr. Brademas. Thank you very much. Mr. Scriven.

Introduction of Dr. Michael Scriven, Professor of Philosophy

Dr. Scriven. I would like to speak to you as somebody who has been involved in the last six years in an attempt to revolutionize the K-12 social studies curriculum—not as a professor but as somebody who decided a number of years ago that we are in pretty bad shape in the high school curriculum and [has been] trying to do the same sort of thing that we did with the physics program after Sputnik.

. . . I have been on the board of directors [of the Social Science Education Consortium] now for six years and we . . . have spent the entire time at the national level trying to get . . . curriculum innovations in the needed areas created and then implemented.

[*Professor Scriven then commented on the common tendency of people to approve of high principles in general but to oppose concrete actions based on these principles.*]

Everybody is for trees but not if it means that we are going to tax [the] *New York Times* [heavily]. . . . Everybody is for trees if it doesn't mean that we pass a bill outlawing paper towels, which is what we should do, except for medicinal purposes. . . . Everybody is for trees until it turns out that that means that [we must give up a] freeway. . . .

[In environmental education,] specific connections . . . have to be made . . . with other areas of the curriculum, particularly and clearly with the economics curriculum. . . .

[W]e need to step up considerably political education, meaning education not only in political philosophy but also in the implementation and decision[s] about political action, which, of course, has to begin with action on the campus with respect to the things which students are involved with.

It's [also] got to be tied into . . . sex education . . . [and] continuing education . . . [and] moral education. . . . There is no ecology action without [a] morality background. There is no way that you can justify . . . interfering with other people—which is what you [do with ecological action]— . . . unless you can say, "I am doing it because of the following arguments. I recognize the rights of others to do things in their own way, but. . . ." This is the whole moral background.

. . .

Mr. Brademas. Thank you very much, Professor Scriven. Indeed I thank all of you. In my judgment your statements have been among the most valuable that we have had because you have turned on some of the fundamental issues of the introduction of a bill, that the introduction of a bill of this kind will raise.

Environmental Education Cannot Meet All Reform Needs

I also am very much appreciative and sympathize with the motif . . . that I think runs through the statements of most of you that . . . we are not doing enough and it is not fundamental enough and the legislation does not contemplate a thorough enough revision or reform, or, indeed, a revolution in some of the existing patterns of education in the United States.

I simply want to say that I am not at all unsympathetic with what you are saying, except that in our line of work—perhaps unlike a good deal of what all of you are saying, and I say this only descriptively—we are incrementalists.

Now, we can't really put in a bill and change everything in 24 hours—nor indeed in 24 months—so that my questions, I hope you will appreciate, are put to you in light of that observation.

Just following on what Professor Scriven just said, I must say, I think he makes a very good point in—indeed, all of you made the point—that . . . if you are to be . . . as effective in this area as one would like to be, you [must] touch on economics and morals and sex and the natural sciences and history and all the rest of it. [However], politically—and I premise this by saying that if you say that unless we do all those things there is no point in getting into this line of work—then we ought to fold up

shop right away, because in my judgment, it is just not possible, given the way in which we make decisions in a country of 20 million people, it is not possible for any one of us as an individual member of a 435-member House of Representatives to push a button and make all these things happen that fast.

So I am just unburdening myself of that initial observation.

Now, if I could put a few questions to each of you that occurred to me as you were speaking, and I hope Mr. Hansen will join me in any point, because there are just two of us here—

Mr. Hansen. Yes.

Clarifying Terms

Mr. Brademas. You were, Professor Schultz, concerned about the phrase which is suggested in the title of the bill, "preserving environment and maintaining ecological balances"—that these are textbook or textbookish cliches—and you were then saying that as scientific or managerial concepts around which to develop sound education programs, they are horribly deficient and completely inappropriate.

Now, you are an authority in this field, why don't you come up with some language that you think would, in your judgment, be more satisfactory?

Dr. Schultz. Yes. My point on this is that in any kind of business enterprise or what have you, you set a goal and then you attempt to achieve it, and I think this is what we ought to be doing with what . . . some people would call environment and what I prefer to call our ecosystem.

We should set a goal on what we want, what this system should do, and then we manage for it. Now, maybe ecological balance—whatever that means—would be our goal, but my point is that whatever this goal is, we should manage for it.

Ecological balance is a sort of a trap, anyway, because it depends on what kind of spatial scale we are talking about, just for balance. So I don't like the term at all. It is a nice thing for an elementary school to use in order to describe it, but this may not be the kind of thing we want to include a name for.

Mr. Brademas. You have not answered my question. We have to write a bill—we don't have to write a bill, but assuming we are trying to write a bill—we've got to put some knowledge in it.

What I am trying to get from you is some knowledge that is more appropriate than the admittedly deficient language that is in it.

. . .

Dr. Schultz. When I said that I deliberately did not want to rephrase it, it is because there are some terms like environment that everybody understands and I admit that everybody understands ecological balance, but when we really come to prepare a program, a program that is going to be sound, that you can work with in a managerial capacity, you know, that you can study and also solve problems in, then I think you have to have a more rigorous thing.

. . .

Professor Scriven. What we are doing to some extent, is responsive to your problem. We are giving you some sort of general thoughts about the background, the academic background, and in my business, the implementation game.

It is not going to affect your bill immediately, but you are thinking about the problems that come up with it. I am not suggesting that you should try to include all the things now, but only that you should face the fact that, to get it to swim, it will need to be tied to these other things —getting it into the curriculum when it gets down to the schoolhouses, the control that voting is going to take and hooking it onto other things because your curriculums are the most rigid objects in the nonlegislative world and they are not going to be moved by good ideas, they are not going to be moved by good policy.

So it is just a thought rather than a suggestion for immediate criticism.

Mr. Brademas. Well, indeed, one of the problems—as most of you have suggested—is, how do you get new ideas into the educational system?

Now, one can say, "Well, the present educational system is outrageous"; but that, of course, doesn't solve the problem because it is here and, at least, it is my own view that one ought to not ignore this given reality and, where possible—since it does make a great impact on the lives of people for good or ill—see how we can help make it more effective, at least in respect to the problem we are talking about here today.

I wonder, therefore, if any of you would care to comment on the kinds of curriculums that you could foresee being offered, [especially in] elementary and secondary schools.

Do you have any suggestions along that line?

Miss Corwin. Well, when I gave the examples, I was trying to suggest that approach; for example, well, it seems sort of obvious with just the games that we have been playing in Berkeley, where the money is, that's where people go.

If you are going to make money available to projects and stipulate that they ought to be interdisciplinary in nature, then people will come up with interdisciplinary projects for primary schools. . . .

Professor Scriven. You see, it is so generalized that, if you are short of money, you simply have to look for the things that have to go to 50,000 schools and the trouble with that is, of course, not that it is noncurricular—which may be a very good thing about it—but because it is noncurricular, you can't package it up and transmit it.

It seems to me that you might want a mix of some of these studies, but I think you ought to go to the subsidizing, to the support of a case study materials book.

Now, that sort of thing can catch on very fast, not much doctrine but a case study of the paper towel; a case study of the *New York Times* as a consumer of newsprint; a case study of half a dozen things not put into very tough language, but simply making the connections.

Now, if you run up a thing like that, you print it cheaply and rerun it every time you get a big order of it, you can get into an awful lot of schools. Then the biology

teacher can use it, half a dozen teachers can use it without losing their identity.

In my experience, the fast move that really catches on happens to be centered around these relatively multi-use materials. I don't know how you write language like that.

Mr. Brademas. Mr. Pepper, were you going to say something?

Mr. Pepper. I might add that too many young people today have become reactive. If they have new ideas when they get home from school, they get pooh-poohed by the parents. This destruction of the inquisitive nature of young people, I think, is also partly due to this rigid compartmentalized primary education and it takes until you get to college to realize that it all doesn't fit together. Then you get rock throwing and other extreme reactionary type of behavior.

I would suppose that you are looking for all kinds of suggestions, and I suggest you put provisions in all federally financed education legislation that the nature of the textbooks that are used must favor holistic or environmental education.

Educating Elementary and Secondary Teachers

Mr. Brademas. Well, now, you raise another point that seems to me to be an important one also and that is the whole question of the training of teachers, who after all are going to be offering these materials.

Assuming the availability of teaching materials, how can we help get at elementary and secondary school teachers?

Mr. Pepper. Well, the elementary and secondary school teachers that are being produced today in this country are in colleges and universities undergoing rapid changes and they are being exposed to the efforts internally in the universities to get a more holistic type of education.

So we are undoubtedly in some revolutionary phase of evolving some more generalized elementary and secondary school teachers.

As far as specific programs, I couldn't offer any specific kind of suggestion outside of a course like the one offered by Dr. Schultz.

Dr. Schultz. Yes. Yet it is very interesting that of all the students that I have had, I have had some 25 different departments represented in my graduate course—which indicates to me at least that it is of wide interest—but not a single student from the college of education.

There is something, there has been something, wrong here that people from the college of education have demanded that students have to have one single solid major so that, when they go into high school or elementary school education, they can teach at least one subject well.

This is the problem in the interdisciplinary field. There is a feeling here that there should be this dominant thing and, then, even though the teacher talks about the environment in general, yet he may say, "Well, the chemical aspect is still the most important one."

. . .

Mr. Hansen. Mr. Chairman, let me echo the chairman's expression of appreciation. I think there were some very stimulating suggestions on this bill.

We will be grateful for any specific guidance that you can furnish to us when we get to the point of drafting actual language which will eventually end up in the statute books. The discussion illustrates the difficulty of our task, that is one of identifying some kind of goals that are fairly specific but, at the same time, leaving the kind of flexibility and room within there can be real innovative and creative action in implementing the bill.

Pre-school Environmental Education

Let me focus on one aspect of the educational process that has not yet been touched upon in the course of the hearings here today and get what response any of you care to make.

I refer to the very early years, so-called pre-school years. Much of the time of our chairman and some of us on our committee over the last several months has been devoted to the development of new legislation in this area of pre-school programs.

We have been impressed with the emphasis that many specialists have placed on the pre-school years as the most important in terms of the intellectual development of the child.

Now, if the goals of this kind of educative efforts—environmental qualitative education—are valid, then there presumably should be some environmental education component in pre-school programs.

So I would ask the question for any of you to respond: what role do you think that this kind of educational effort should play to kindergarten and pre-kindergarten years?

Professor Scriven. . . . I was on the valuation staff of Headstart and I was concerned with it recently in looking at these things.

. . . [I] we think about environmental education . . . in terms of . . . what analytical schemes [students] can learn, we are likely to be disappointed; but we can move in another direction—and it may be a very good opportunity to try just that—and that is expanding the child's range of values, expanding the child's range of interests, enjoyments, pleasures, by exposure and supplementary discussion in talking about explanations and so on—not in the hope that all the explanations will stick, but in the hope that there will be a shift in the set of learning and controlling attitudes in later years. . . .

You might easily see the child follow it up in later years. I think my response, Mr. Hansen, is the direction should be there in modifying his set of values so that he develops an interest in nature, an interest in his environment and evaluating his follow-up in terms of his later choices.

Mr. Pepper. Not being a child educator, this is off the top of my head, but it seems to me that the expectations of a young child are a very important part of his future. If he is introduced at a very early age to a large number of artifacts and he develops a high degree of dependence on—I don't want to use technology—but on the products of a highly productive system, it may raise his level of expectation in future years. It might be well to address the pre-school education to a more back-to-earth orientation.

. . .

Miss Corwin. Are you thinking in terms of pre-school programs that are taking the children away from their parents and putting them into some other situation?

Mr. Hansen. I think it would probably encompass two types of programs: the modified expanded Headstart programs where children are in a center, but where services are also rendered to the children in their homes.

Miss Corwin. Well, it seems to me the best way to affect the children, the young children—the very young children—is through action-type things rather than explanations and so forth. And, of course, the best way to do that in the second case is, you know, to educate the parents and then come to the children.

But the kinds of things which I think were very effective with children are that the teachers in their own lives—I guess it applies across the board and applies to you, gentlemen, and applies to us here—in a way that you act in your own life, you are acting in ways that show that you have a concern for the environment and for the world around you in the things that you do instead of just going on assuming that, whatever you do is OK and what you can get away with is OK and the children then will pick this up. This is sort of clear.

For example, my statement I typed in single space deliberately because I use less paper that way and if I had time to type a stencil, I would have mimeographed it and used both sides of the paper. If you people want to do it in Congress, make sure it is on both sides and single spaced and explain why, and all the rest of the suggestions that you would like to list would I am sure come from that.

Mr. Brademas. The suggestion has been made.

Miss Corwin. But, of course, the way we act in our own lives, that is the way the children will react. Just by doing these little things, then, when they ask you why or tell you why you know, you tell them. If they don't ask and they really perceive that you have comprehension, that the things that you do affect the world around you, you are going to make yourself responsible to the world around you.

I know that my parents are like this. As far as littering, my parents did not have that kind of attitude. I would never dream of littering because they had the attitude that the world is clean now and it is something that is against my inner being, it is something I learned so very young.

This kind of thing can be done at all levels and certainly government is a good place to start it. That will come back to the children.

Encouragement of Nontraditional Institutions

Mr. Hansen. Let me just ask one further question of Miss Corwin relative to your suggestion, with which I fully agree if I understand it, that we make every attempt to provide an opportunity for what you call the nontraditional institutions to participate in the programs and it would be established in this legislation.

Now, if I interpret your comments correctly, then I share your criticism of a system wherein those members who are on the board and make the selections receive the lion's shares for programs that are funded by the federal government.

My only plea is for any help that you can give us in the way of suggested language that would make it possible for the nontraditional institution, that would make it possible, for example, for something like the College of Southern Idaho that has the same chance to participate as Harvard or the University of California.

Mr. Brademas. Now you have gone too far. [Laughter.]

Miss Corwin. Well, I really didn't mean colleges by nontraditional institutions. No matter how small they are, the colleges and universities are still operating on the same set of values, competition and so forth. I don't mean institutions at all; you can call it an ad hoc group. . . .

My suggestion for wording the bill was that you actually list prototypes of these sorts of groups as examples, as administrative guidelines; because then, if a group wants to get funded, that way they will be able to say, "Well, look here in the bill it says, for example, a group like Ecology Action, which can get this and list the description as an example of the kind of group that can be funded."

. . . [Another example is] the Free University. . . . [T]hese are really marvelous ways of getting an education because they are not free in the sense that there is no expense, but they are free in the sense that there is no competition, there are no grades, there are no scholarships or anything like that. You just go and you take the courses with the teacher. You just drop it and you take another one, whatever you like. I had a very marvelous ecology course, one of the first ones I took in the Free University before ecology became well known; and we hiked with a gentleman up to Sonora Pass and, as we went up each level through Sonora Pass, this gentleman pointed out the level and the relationship to each level as we went up. This individual had done his thesis work on the biotic communities of the hillsides outside San Diego. That's the first time I understood the word "ecology."

It is this kind of thing; if you specifically say in the bill prototypes of the kinds of things that get the money, those would have to be guidelines administered in the program.

Mr. Hansen. Again, I concur with what you are saying, that any group—if they get together and come up with an idea that deserves to be explored and developed—should have the opportunity to make the proposal and receive some assistance.

The problem in drafting legislation, you see, is to identify the goal sufficiently but, at the same time, provide a fairly wide area within which entirely new ideas may be developed.

Professor Scriven. Well, there are two specific things that I really think your committee might do, Mr. Chairman, just because of your general obligations:

One is to really throw out the Office of Education application forms. They are the worst in the world, not just in the United States but they lead the world by far.

You probably have heard that kind of comment before, but I will say that I don't consider myself stupid but I found myself unable to complete the forms required to get postgraduate scholarships for one of my students, even after they had called me up and said, "We will give it to you; it's already awarded; all you have to do is fill the form in."

Well, I still couldn't do it, I mean in a period of some weeks.

But I think if you are going in particular to Mr. Hansen's question, where he is looking for bringing in some of the groups that are not trained in grantsmanship, it is terribly important to do that. I get scared off easily. . . .

But as a second point, I am against the university extending this sort of degree, including the Southern Idaho College, because it would be an unfair advantage for them since they still have an environment. [Laughter.]

Mr. Hansen. Well, we will try to hang onto it as long as we can.

. . . [W]e would like to have a one-page application form and I think that certainly could be improved and perhaps that might be one of the goals in implementing this bill, if we can get a very short form so that anyone can understand it and put down an idea and have the opportunity.

Professor Scriven. I would be happy to volunteer my services in helping in that.

Mr. Hansen. Thank you very much to all of you. Thank you, Mr. Chairman.

Mr. Brademas. Well, I reiterate, Dr. Scriven, Mr. Pepper, Miss Corwin, and Dr. Schultz, I appreciate your contributions and indeed the contribution of all witnesses in San Francisco.

Tomorrow the subcommittee will be in Los Angeles. We thank you once again for the hospitality that has been extended to us by Dr. Lindsey and by the California Academy of Sciences in allowing us to have our hearings here.

The subcommittee is adjourned.

(Whereupon, at 4:46 p.m., the subcommittee was adjourned.)

DAY 13

House of Representatives, Select Subcommittee on Education
Los Angeles, California

May 2, 1970

The final session of the subcommittee's hearings was held in Los Angeles. Among others, a journalist and a community action program administrator gave testimony.

Gladwin Hill, national environmental correspondent for The New York Times, *discussed the role of newspapers in public education about environmental issues. He pointed out that the mass media are the main channels of education outside formal educational institutions. He expressed concern that some of the wording of the bill might stir up misgiving about federal "propaganda" and control of the news. It is essential that the government provide information, but it must take care it is objective and factual. Hill proposed several ways for the federal government to disseminate information to the news media through information centers, through handbooks, and through symposia. When the committee queried him about ways of controlling misleading advertising by polluters, Hill described two major methods employed by newspapers. One control is the "sifting out," by newspapers themselves, of misleading advertisements before they are ever published. The other is counter-balancing corporate advertising through news and commentary.*

Ted Watkins, project administrator of the Watts Community Action Committee, declined to testify in his official capacity, due to the government regulation forbidding organizations funded by private non-profit foundations to influence legislation. In his capacity as an individual citizen, however, he brought the viewpoint of the minorities and ghetto inhabitants before the subcommittee. He asked two major questions of acute relevance to environmental solutions. First, who is going to have to make the sacrifices necessary to improving environmental quality? Watkins cited the specific example of population control: how does this affect minority groups living in a system of majority rule? Second, Watkins asked how we can teach conservation to youngsters who are surrounded by so little worth saving. Watkins emphasized the importance of tying action programs to environmental education in stating, "To teach these kids about the beautiful things to save when there is nothing in that community to save—it seems to me like you're further frustrating them."

The subcommittee met at 10 a.m., in room 8120, Federal Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Bell, Reid, and Hansen.

Staff members present: Jack G. Duncan, counsel; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. Brademas. The Select Subcommittee on Education of the Committee on Education and Labor of the House of Representatives will come to order.

For the purpose of further consideration of the bill H.R. 14753, the Environmental Quality Education Act, we are meeting here.

The Chair wants to state at the outset how very pleased we are to be here in California and in the Los Angeles

area for the purpose of hearing witnesses on this significant piece of legislation. . . .

The subcommittee is particularly pleased to be able to welcome here today, or to invite to welcome us here today, our distinguished colleague, one of the outstanding members of the Committee on Education and Labor, your own representative in Congress and one who has won the regard of members of this committee and of the House of Representatives on both sides of the political aisle, Congressman Alphonzo Bell, of the 28th District of California.

Mr. Bell. Thank you very much, Mr. Chairman.

Chairman Brademas, I want to commend you for your leadership in bringing these hearings out here. Greater Metropolitan Los Angeles is on the front line in the increasingly urgent national battle against pollution. Problems involving loss of control of the environment here, particularly our smog, have troubled us for almost a quarter of a century.

Local citizens have come to expect public officials to talk about pollution. They do not have great confidence that public officials will do anything about it. Perhaps for that reason, it is especially useful for the House Select Subcommittee on Education to hold one of its hearings here to take testimony on the pending Environmental Quality Education Act.

I am pleased to be a cosponsor of this bill. . . .

Thank you, Mr. Chairman.

Mr. Brademas. Thank you very much, Mr. Bell.

. . .

[*The first witness of the day was Rudolph J. H. Shafer, a consultant on conservation education, Bureau of Elementary and Secondary Education, California State Department of Public Instruction. Mr. Shafer offered a brief review of California environmental education programs, and stressed the need to secure state support and state interaction in any program resulting from the bill. He offered for entry into the record of the hearings a report by the Conservation Education Advisory Committee to the California State Board of Education. Excerpts from this report may be found in Appendix E of this book.*

The subcommittee next heard from a panel of students, including Nick Brestoff, director of the Students' Environmental Confederation of California; Ora Citron, director of the Southern California Environmental Coalition; Kim Marienthal, founder of Attack Contamination Today, a high school group; and Ron Eber, co-chairman of Students' Environmental Confederation of California.]

Introduction of Gladwin Hill, National Environmental Correspondent, New York Times

Mr. Brademas. . . . The next witness is Mr. Gladwin Hill, national environmental correspondent, *The New York Times*.

Mr. Hill. The job of rehabilitating our environment, I think, is one that can be done only through mass action with mass support and that implies mass familiarity with the intricate details of environmental problems.

The degree of public ignorance today is appalling. Environmental quality begins at home and most people have no idea of where their local sewage plant is, let alone what sort of treatment it gives to sewage. Most people have no idea of the amount of chemical treatment it is now necessary in most communities to give to drinking water to make it safe and palatable. Most people who help pollute the atmosphere with their automobile couldn't tell you the three main chemical categories of exhaust emissions or the statutory limits now in effect on these exhaust emissions. Most people, I would venture, couldn't tell you within one billion the population of the world or its rate of increase, although this is a matter of critical importance.

These and thousands of other facts about environmental problems are going to be as vital for citizens to know as anything beyond the multiplication table and the ability to read and write. The urgent need for this knowledge implies one of the greatest educational efforts of all time, which I am sure is the motivation behind your bill. This effort will need to use every available channel of communication, particularly the educational system and the mass media. . . .

Government Provision of Objective Information for Use by the Mass Media

The mass media will be the main channel of educating people outside of school and college structures. Newspapers, broadcasting stations, and magazines certainly can use some stimulation and information.

My opinion and that of others in the news business is that any sizable newspaper or major broadcasting station needs a full-time environmental specialist today just as much as it needs a man in city hall, on the police beat, or sports.

That is far from the case, today.

I would guess, as far as I know, in the field of newspapers, out of a couple of thousand daily newspapers in this country, there are probably not more than a dozen or two that have a full-time environmental reporter. That limited extent of coverage may give an idea of the problem that confronts you in just educating the media with which you hope to educate the public.

Your bill bothers me a little on one point that I trust is a matter of semantics. That is where it says grants should be made, "for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology," unquote. To some people in the mass media, that might conjure up pictures of governmental agencies cranking out prefabricated news material to be developed into publication or broadcasts, raising the old bogey of government propaganda. No one should lose sight of the fact that while rehabilitation of the environment is, like motherhood, something everyone is in favor of, nearly every phase of this rehabilitation has aspects that are political and controversial.

Nevertheless, there is a vast body of factual information that needs to be conveyed to people about environmental problems before they will be in a position to even start arguing intelligently about them. That area of factual information, just as antiseptic and clinical and objective as census information, is the sort of material on which any federal agency would be well advised to concentrate as far as the mass media are concerned, if the agency does

not want to find itself in the midst of the same kind of tempest that has arisen over sex education.

Some sort of active publishing or distribution of objective information might be found workable, but I can think of several other means that could be utilized as well.

Information Dissemination via Information Centers, Handbooks, and Symposia

One would be the development of an information center on which the media could call voluntarily for environmental data as individual organizations want it to. That would lift the stigma of propaganda being planted. And there is a great need for a recourse--resource—like that, today.

Another useful device would be the background media handbook. One reason the public has gotten a very detailed account of the Apollo program is because early in the game North American Aviation here in Los Angeles, in collaboration with other major contractors, turned out a very well-produced, well-indexed, looseleaf background factbook, distributed to writers and editors, that could be updated periodically. And this was done, I would note, without getting into any of the controversial areas of the Apollo program.

Another device which has been used successfully on a small scale—and I do not know why it should not be used a lot more in educating the media on public problems—is the symposium, a national or regional gathering to which selected executive editors and reporters or, for that matter, any other professional categories of people—educators or people in government—a meeting to which they are invited at which topnotch experts brief them on the latest information in a field and there is an opportunity for extensive two-way discussion.

An example of this is a thing that the American Cancer Society does almost annually. They hold sessions of from one to several days around the country where there are concentrations of cancer experts and cancer research. They regularly come to Los Angeles. And qualified reporters, science editors, national and local, sit in on as many of these sessions, going from place to place, as they want to, so you have sort of a revolving group. You hit the large media as well as the small or, at least, you give them an opportunity. This is a very relatively inexpensive sort of operation. The reporters pay their own expenses. The main cost is that of organizing the sessions. These tours, I know, have contributed greatly to media understanding and public understanding of the facts of cancer. There is no reason why the same format could not be adapted to the even more important realm of environmental problems at a minimum expense to taxpayers. But I do not close the door on any means of disseminating information. We will need every means we have to really come to grips with this critical problem of environmental degradation.

Parallels between Dissemination Programs for Teachers and for Journalists

Mr. Brademas. Thank you very much, Mr. Hill. It is a most useful statement and I am particularly struck by some of your specific concrete suggestions such as that of the information center for the media and the symposium and handbook information.

In essence, it seems to me what you are suggesting for the media is something not unlike what has been suggested for teachers of environmental studies, especially at the elementary and secondary school level where there might be symposia or institutes, as they have come to be called, for teachers.

It has also been suggested that, in Washington, at the U.S. Office of Education in the Department of—or the section that would deal with environmental education—there be a central repository of teaching materials which could be made available to school systems all over the United States or to private nonprofit organizations of the kind represented by some of our witnesses here earlier that might wish to undertake support of such studies.

Is that—did I misstate what you have in mind?

Mr. Hill. No; that is what I had in mind and the thing could be enlarged as much as you want it. I would not be frightened at the idea of a large building in Washington with some sort of an agency acting as an information center on this vital area.

It could be enlarged even beyond the media, to the point where citizens could go. I am very conscious of the fact that we have, as a nation, some tremendously momentous decisions before us in the years immediately ahead—things on what we are going to do about population, the internal combustion engine—and unless decisions, needless to say, are backed, supported by and involve a great mass of public understanding, the understanding of people in general, they are not going to be valid, they are not going to stand up.

Mr. Brademas. Well, I appreciate that.

. . .

Counterbalancing Advertising by Polluters

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Mr. Chairman, let me also express my appreciation for what I think are some very helpful specific recommendations concerning the implementation of this bill. I would only raise a question, that grew out of our hearings yesterday, to solicit your comment.

Some of the witnesses in San Francisco made reference to educational problems that are being undertaken by many of the corporations through advertisements in the mass media, calling attention to the contributions they are making in cleaning up the environment. Many of the observations made by the witnesses who addressed themselves to the subject were to the effect that much of the material in the advertisements is misleading and inaccurate and designed apparently primarily to clean up the image of the corporation. In our discussion, we focused attention on the responsibility of the media itself—and advertising agencies—in trying to develop some kind of basic standards that might be applied. I would be grateful for your comments on this problem, if you think it is a problem, and on what you think the newspapers and the media generally can do to help contribute to the dissemination of accurate, balanced information to the public.

Mr. Hill. Well, I do not think that, generically, you have a different problem here from what you have always had with corporations tending to put their best foot forward or advertise their wares. They have always done that, in advertising. They have never told you about the labor troubles or the financial troubles or the stuff that was behind the facade and so it has always been up to the media to bring out both sides, really—on the financial page, to tell the story of their financial pros and cons and vicissitudes and, on the news pages, to deal with things like labor troubles and that sort of thing.

I think this can be carried over into this area. I can't foresee big corporations—certainly, they are gilding the lily, right at this moment, a lot of them—I can't see them becoming really mendacious about the business because it would be very bad public relations; but if they should, there are two areas where it can be hit.

One is, most sizable, sophisticated newspapers are quite discriminating about sifting out misleading advertising. In *The New York Times*, for instance, somebody can't even say that they have the largest, the biggest sale of fur coats in history unless they can affidavit it. So you would get into exaggeration, that way.

And then, your other safety valve is putting the things in proper perspective in the news columns, which is our constant struggle all the time, and I think . . . we are up to it in principle but we just have a huge job ahead in terms of volume.

It's like the Edison Company down here in Los Alamitos has struggled for years to get rid of objections about the stuff coming out of there. Well, the stuff comes out at the rate of somewhere between 500,000 and one million cubic feet a minute and that much volume of anything is just almost impossible to deal with, but ways can be found.

They are finding the only way you deal with a thing like that, you can't treat anything that comes at you one million cubic feet a minute; you've got to change where you start in the beginning by putting in a fuel that is not so obnoxious.

We will have to narrow things down on the informational side the same way. And that is something that, at least on the *Times*, we are worrying about and talking about, conferring about the planning about all the time—is how do we get this story across in the most, in a way that is meaningful? How do we cover the bases? At the same time, how do we not spread ourselves too thin and confuse people?

I think it is about the biggest challenge that the media have ever had. I mean, it makes covering a war relatively simple because this a huge thing, far bigger than a war; it is going to go on as far as we can see ahead.

The "Big Lie": Industry's Anti-pollution Image

Mr. Brademas. Mr. Hill, just following what you have said, I cannot forbear making one other point. I guess I really do not—though I find myself in agreement with most of what you have said—I do not really find myself in agreement with your last point with respect to, if I understood you correctly, to the lack of mendaciousness on the part of, to quote you, many industries; I do not believe that. I think it is quite clear on the record that a lot of industries do lie. I should have thought that one of the contributions that Ralph Nader has made to the public is to point out that the claims made by many of the automobile producers in the United States about the safety of their cars and so on quite obviously, by virtue of the fact that so many of them, after the Congress passed a law requiring certain safety standards, had to turn them back; that the revelations with respect to a number of the representatives made by American pharmaceutical manufacturers about the drugs that they produce have been, have made clear that, have made it very clear that they have been lying to the American people about what their drugs could do and could not do.

I do not pretend to be an expert in this field but I do not really think you meant that, did you?

Mr. Hill. No. I was thinking more in the framework of Mr. Hansen's question about advertising. Specifically what I was thinking is that a big advertising agency is going to think several times before they put an outright misstatement in an ad where it is conspicuous.

I think the big problem we have to deal with is along the line of what you were saying, that the biggest problem is the big lie which is not expressed specifically on a given piece of paper, at a given time. To me, the big lie that American industry has been putting out either directly or indirectly, consciously or subconsciously—doing it for some time—is the notion that it is exerting itself on this field of pollution control.

The National Industrial Conference Board just came up with a figure that industrial outlays on pollution controls for last year, 248 major corporations, which pretty well covers your big ones—was $300 million. Well, that is ridiculous.

Mr. Brademas. Perfectly.

Mr. Hill. You take that and relate it to gross national product, you relate it to value added by manufacturing or any other economic yardstick and it is ridiculous. It is no effort at all. And that is something that has to be spotlighted, and we intend to do it.

Mr. Brademas. I agree very strongly with what you said but I cannot resist being contentious one more time. I do not at all agree with you that advertisers in this country refuse to advertise products with respect to which representations are—misrepresentations are—made.

Yesterday, we heard from a prominent advertising agency head here and he made very clear that most advertisers in the United States—by which I mean people who are professional advertising agencies or professional public relations agencies—do not really have, there is no standard, there is no code by which they make an ethical judgment on the issue of whether or not the client's product is an honest product or not. They just do not. They advertise the product.

Mr. Reid. If the chairman would yield, at that point—

Mr. Brademas. Yes.

Responsibilities of Newspapers in Exposing the "Big Lie"

Mr. Reid (continuing). I would add to that . . . two things. One, I think there are certain industries, as a

whole--powerplant industry being one, the oil industry another—who frankly are claiming that they are doing something about pollution when, in fact, they are not and in some cases are making it worse.

The question that I would raise here is: should the major newspapers now take a look at what you call the oversimplification and the big lie?

When an airplane manufacturer says they are retrofitting jet engines and have solved, to some degree, the pollution problem by removing soot but, in fact, what they have done is break it up into particles you cannot see which will now stay in the air for four to five years and, therefore, they have actually made the problem perhaps worse, I wonder if newspapers now have a responsibility to look a little bit back of this question of when they rather glibly say they are building a safer car or that power is going to be clean or whatever they may say.

Mr. Hill. Oh, absolutely, I would agree with you there and I would not disagree with you at all on—again, I was thinking in terms of, you know, really specific misstatements but the—

Mr. Brademas. No; I am not talking about robbery in broad daylight, at noon. I am just talking about what is very often standard operating procedure. I do not think we are in disagreement, Mr. Hill.

Mr. Reid. No.

Mr. Brademas. I want just to conclude our questioning of you here by expressing our appreciation both to you for the pioneering work that you have done as a journalist in the entire environmental field and pay a tribute to *The New York Times*, because *The New York Times* helps set the pace for journalism in this country—and on your great newspaper, out on the frontier, hopefully, you are going to induce others to following your leadership.

Mr. Reid. I might just add that I share that view, from what I know of your pieces in the *Times*. But also I make some plea to you that there are some trends abroad in the land that are worrying and I think the *Times* and other great papers have got particular responsibility to keep telling the truth irrespective of whether reporters' notes are seized or particularly as some of the networks are now being frightened, so I hope that, if anything, you will continue your leadership and make it more explicit. A lot rides on both your accuracy and the courage.

Mr. Hill. Well, thank you. We certainly will try to.

Mr. Brademas. Thank you, Mr. Hill.

Mr. Reid. Thank you, Mr. Hill.

Introduction of Ted Watkins, Watts Labor Community Action Committee

Mr. Brademas. The next witness is Mr. Ted Watkins, of the Watts Labor Community Action Committee.

The Chair would like to ask unanimous consent that there be read into the record, prior to Mr. Watkins' statement, the text of a letter dated April 29, 1970, to the Chair from Mr. Watkins, in which he makes clear that he is testifying not as project administrator of the Watts Labor Community Action Committee but as a private individual.

Is that accurate, Mr. Watkins?

Mr. Watkins. That is right, sir.

Mr. Brademas. Pleased to see you here, sir, and go right ahead.

(The letter referred to follows:)

WATTS LABOR COMMUNITY ACTION COMMITTEE,
April 29, 1970

Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education, Committee on Education and Labor, Washington, D.C.

DEAR CONGRESSMAN BRADEMAS: I am sorry to advise you that I am unable to testify before your Committee at the present time. As Project Administrator of the Watts Labor Community Action Committee, I do not want to jeopardize one of our critical funding resources--namely, private foundations.

The Tax Reform Act of 1969, page 29, section 49-45 D and E, makes it illegal for any organization receiving support from private foundations to, in any way, influence legislation or legislative bodies. I am sure that the Subcommittee members are very much aware of this legislation and can appreciate the need for my declining to participate in these hearings.

If, however, the committee has any questions to ask me as a private individual, I will of course be happy to cooperate.

TED WATKINS,
Project Administrator

Mr. Watkins. Well, I guess after most of the things that I have listened to back here in the room, I begin to wonder when they really start applying to a community like Watts.

On the educational part, to tell kids in a school in a community like Watts about saving environment and the needs for conservation and all these things and knowing the conditions of the schools that they will be taught these things in, it seems to me to be a frustrating and fruitless effort.

There are three schools that I know of in Watts starting from the elementary school which has a pile of junk behind it. That's similar to me like the thing that happened in England when the mountain came over on the school and destroyed the students. That school is an elementary school on which to begin.

The next school down there is a school down the street, a little further, which is a junior high school which is backed up by industry.

And the high school, which is Jordan High School, is another school up the street further, that is also, on the east side of it, completely backed up by junkyards and industry.

I don't know how a kid can think in terms of the kind of environment we are talking about when from the elementary school until he graduates from high school, he is placed with the junkyards and the trash.

I can understand, looking out this window, what you are talking about when you say, "environment."

Environmental Programs in Watts

One of the things that we did in Watts was, back in 1966, we started what we call a conservation corps program, a Community Conservation Corps.

Since that time, we have planted some 10,000 trees in Watts. We have built 11 vest pocket playgrounds in the community and we have taken land that was the right-of-way land for the power and water company and it was a

blight in the community and changed it into strips of parks and growing flowers and vegetables under those power line mains.

We have an educational institution up in Saugus where we're taking kids out of Watts—as a matter of fact, 300 of them a week—and they go up there and learn vocational education five days and four nights a week; and we felt that the only way we could make an impact on these kids is that we had to get them out of the environment of Watts.

So other things that we have done in the same area is that in 1967, we took 2,600 kids up to Camp Roberts, 300 miles away from Watts, and went through the summer of 1967 giving them that experience away from the community and out in the wilderness; and also on the hottest desert, I guess, in the whole world, is that Camp Roberts place, but the kids enjoyed it. For the first time in their lives they've been out of Watts and out of those housing projects.

Minorities and Population Control

There are a couple of things that I have heard here also that I would like to make some comments on, because it begins to be a question of who is going to be sacrificed.

When I heard the name of Stephanie Mills mentioned here, the first thing I hear is the question of population explosion and who is going to begin to cut back on the population when in my instance, the—I have always been taught it's the majority rule in this country and if you're in a minority group, the only way you ever become equal to that majority is by continuing to explode, as far as the population is concerned. So in that case, I'd like to know what the rules are when we're going to begin to level this thing out that we can have a rule that says that for every household, there are so many kids, two to a family or something like that, when this kind of a majority rule still exists as far as democratic form of government is concerned.

Community Action Groups

One of the other things that I am very much concerned with and that is that this law, I think, in order to have its full effect, has to be oriented not only toward the institutions but also toward community action groups, because I guess the only reason we've done the things that we have done in Watts is because none of the institutions would do them and neither would the—

Mr. Reid. Could you expand on that?

Mr. Watkins. Well, in the first place, when we started out, for instance, in the summer of 1965, we found that kids were placed out on the sidewalks and this is happening in all of the cities in the United States, with gates of schoolyards closed. Everybody seemed to go off someplace and leave these kids on the street. Federal agencies had geared programs not to problems in the community but basically to somebody's criterion of what they felt was needed. We started a program, in 1966, of how to involve yourself with the youth in the community, who basically have the problem.

Headstart project was in effect but nobody touched kids seven years old to 15 because there were no federal funds available for kids seven to 15 years old, so we felt that the basic problem in being in Watts when August of 1965 came, that the basic problem out there was youth out there on streets, from seven to 15, were the first kids to throw the bricks and as a result of that, a number of others began to get engaged.

We involved ourselves in the Community Conservation Corps program, starting out one program for 300 which ended up with 3,000 kids. We removed bricks and put rakes, hoes, shovels, and spades in their hands and began to clean up that community.

We began to find out who owned vacant lots in the community and found out that the city and the county owned most of the vacant lots because they had been taken over for taxes and we changed those vacant lots into vest pocket playgrounds where young kids living on the streets didn't have to walk ten, fifteen blocks across a couple of railroad tracks in order to get to a playground.

This began to involve the community in the supervision and the upkeep of those playgrounds.

In 1967, like I said, when we took those kids to Camp Roberts, again, the playgrounds were closed. We were faced with a growing resentment on the parts of the kids of having Detroit getting a bigger record than they had, so we felt that the only thing left for us to do was to try the experiment of removing the kids completely from that hot asphalt and so forth and we took them to camp.

None of the institutions have involved themselves in any of that kind of thing except when they began to have summer crash monies to do it.

Teaching Conservation Where There's Nothing to Conserve

Environment. Like I say, when you're talking to us about it, in one instance, people who can appear before this board have had all of the benefits of the environment of a community like this.

And then, when the problem of them having to locate a junkyard, for instance—and many of the people who own those blights in our community live in communities like this—then, the only thing for them to do is throw them in. One of the largest junk dealers in the community lives here in Westwood but his junkyard is over there behind this elementary school.

I think these are parts of the problem. The educational process is going to have to take place not only in the school level but I think there has to be some way that the budget has to be tied with some way of improving the environment of where you are teaching that education.

To teach these kids about the beautiful things to save when there is nothing in that community to save—it seems to me like you're further frustrating them.

Mr. Brademas. I appreciate, as we all do, Mr. Watkins, your statement.

I believe I am correct in saying that you were quoted recently in *Esquire* magazine in a piece to the effect that it is pretty difficult for blacks to get deeply interested in the problems of the environment because of the kinds of problems that you have been discussing with us here today.

I would simply observe that one of our earlier witnesses, Dr. Margaret Mead, the anthropologist, said that it will be difficult—in effect, she echoed what you have suggested when she said that it would, in her judgment, be difficult to get people concerned about how our country is going to look 50 years from now if people in 1970 are not sensitized to the fact or aware of the fact that we have got a lot of poor people and hungry people and people who are in poverty and are discriminated against in our society, right now. And she spread the hope, as do I, that the new concern about ecology and the environment and the shape of our society half a century from now will lead us to be more deeply concerned about problems here and now that face us.

I hope—I assume from what you said that we are not in disagreement on that.

Mr. Watkins. No, I do not think we are.

Mr. Brademas. Mr. Reid.

Mr. Reid. I would just observe in relation to that colloquy that both Mr. Brademas and I have long urged the implementation of the Kerner report, and the major change put forth in the Kerner studies is an abolition of racism in this country. I think unless we do something in this area at the same time that we do something in terms of environment, that it will have less meaning. So I share your concern; and in our interest in the environment, we must not forget the other areas that we have neglected for hundreds of years.

I would certainly like to compliment you on the program that you mentioned for Watts, the importance of reaching the seven to 15 year olds.

. . .

Mr. Brademas. Mr. Watkins, thank you, again. We are aware of the fine leadership you are giving in Watts and we are very grateful to you for having come.

Mr. Watkins. Thank you.

. . .

[*The final witnesses before the subcommittee were Marc McGinnes of the Santa Barbara Community Environmental Council; Dr. John Mohr, professor of Biological Sciences at the University of Southern California; Mr. Leslie Reid of the Los Angeles chapter of the Sierra Club; and Mrs. Leslie Reid, a biology teacher at Los Angeles Polytechnic High School.*]

Mr. Brademas. The Chair wants to reiterate his appreciation to our colleague, Congressman Bell, for having made arrangements for us to conduct these hearings in the district that he so ably represents and, indeed, to express appreciation to all of the witnesses who have appeared before our subcommittee, in San Francisco yesterday and here today in Los Angeles.

This is our last day of hearings on the Environmental Quality Education Act and the Chair hopes very much that with the support of members of this subcommittee and other members of the House of Representatives and the Senate, we shall succeed in writing into law a bill which I hope will not only be valuable in stimulating education about the environment but will also symbolize what I think all of us hope is a deepened sense of the profound importance of the environment to the future of our country and of mankind.

We are adjourned.

(Whereupon, at 2:49 p.m., the subcommittee adjourned.)

APPENDICES

Appendix A
THE ENVIRONMENTAL EDUCATION BILL

H.R. 14753, 91st Congress, First Session

A BILL To authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Environmental Quality Education Act".

STATEMENTS OF FINDINGS AND PURPOSE

Sec. 2 (a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance is in part due to poor understanding by citizens of the Nation's environment and of the need for ecological balance: that presently there do not exist adequate resources of educating citizens in these areas, and that concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this Act to encourage and support the development of new and improved curriculums to encourage understanding of policies, and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curriculums in model educational programs and to evaluate the effectiveness thereof; to disseminate curricular materials and information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community and industrial business leaders and employees, and government employees at State, Federal, and local levels; to provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance.

USES OF FUNDS

Sec. 3. (a) From the sums appropriated, the United States Commissioner of Education, hereinafter referred to in this Act as the "Commissioner", shall assist in educating the public on the problems of environmental quality and ecological balance by:

(1) Making grants to or entering into contracts with institutions of higher education and other public or private agencies, institutions, or organizations for:

(a) Projects for the development of curriculums to encourage preserving and enhancing environmental quality and maintaining ecological balance.

(b) Pilot projects designed to demonstrate and test the effectiveness of the curriculums described in clause (a) whether developed with assistance under this Act or otherwise.

(c) In the case of applicants who have conducted pilot projects under clause (b), projects for the dissemination of curricular materials and other information regarding the environment and ecology.

(2) Undertaking directly or through contract or other arrangements with institutions of higher education or other public or private agencies, institutions, or organizations, evaluations of the effectiveness of curriculums tested in use in elementary, secondary, college, and adult education programs involved in pilot projects described in paragraph 1 (b).

(3) Making grants to institutions of higher education, local educational agencies, and other public or private organizations to provide preservice and inservice training programs or environmental quality and ecology (including courses of study, symposiums, and workshops, institutes, seminars, conferences) for teachers, other educational personnel, public service personnel, and community, business and industrial leaders and employees, and government employees at State, Federal, and local levels.

(4) Making grants to local education, municipal, and State agencies and other public and private nonprofit organizations for community education on environmental quality and ecology, especially for adults.

(5) Making grants for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology.

APPROVAL OF APPLICATIONS

Sec. 4. (a) Financial assistance for a project under this Act may be made only upon application at such time or times, in such manner, and containing or accompanied by such information as the Commissioner deems necessary, and only if such application—

(1) provides that the activities and services for which assistance under this title is sought will be administered by or under the supervision of the applicant;

(2) sets forth a program for carrying out the purposes set forth in section 3 and provides for such methods of administration as are necessary for the proper and efficient operation of such programs;

(3) sets forth policies and procedures which assure that Federal funds made available under this Act for any fiscal year will be so used as to supplement and, to the extent practical, increase the level of funds that would, in the absence of such Federal funds, be made available by the applicant for the purposes described in section 3, and in no case supplant such funds;

(4) provides for such fiscal control and fund accounting procedures as may be necessary to assure proper disbursement of and accounting for Federal funds paid to the applicant under this title; and

(5) provides for making an annual report and such other reports, in such form and containing such information, as the Commissioner may reasonably require and for keeping such records, and for affording such access thereto as the Commissioner may find necessary to assure the correctness and verification of such reports.

(b) Applications from local educational agencies for financial assistance under this Act may be approved by the Commissioner only if the State educational agency has been notified of the application and been given the opportunity to offer recommendations.

(c) Amendments of applications shall, except as the Commissioner may otherwise provide by or pursuant to regulation, be subject to approval in the same manner as original applications.

ADVISORY COMMITTEE ON ENVIRONMENTAL QUALITY EDUCATION

Sec. 5. (a) The Secretary of Health, Education, and Welfare shall appoint an Advisory Committee on Environmental Quality Education which shall—

(1) advise the Secretary concerning the administration of, preparation of, general regulations for, and operation of, programs supported with assistance under this Act;

(2) make recomendations regarding the allocation of the funds under this Act among the various purposes set forth in section 3 and the criteria for establishing priorities in deciding which applications to approve, including criteria designed to achieve an appropriate geographical distribution of approved projects throughout all regions of the Nation;

(3) review applications and make recommendations thereon;

(4) review the administration and operation of projects and programs under this Act, including the effectiveness of such projects and programs in meeting the purposes for which they are established and operated, make recommendations with respect thereto, and make annual reports of its findings and recommendations (including recommendations for improvements in this Act) to the Secretary for transmittal to the Congress; and

(5) evaluate programs and projects carried out under this Act and disseminate the results of such evaluations.

(b) The Advisory Committee on Environmental Quality Education shall be appointed by the Secretary without regard to the civil service laws and shall consist of twenty-one members. The Secretary shall appoint one member as Chairman. The Committee shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology. The Committee shall meet at the call of of the Chairman or of the Secretary.

(c) Members of the Advisory Committee shall, while serving on the business of the Advisory Committee, be entitled to receive compensation at rates fixed by the Secretary, but not exceeding $100 per day, including travel time; and while so serving away from their homes or regular places of business, they may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5 of the United States Code for persons in the Government service employed intermittently.

TECHNICAL ASSISTANCE

Sec. 6. The Secretary, in cooperation with other Cabinet Officers with relevant jurisdiction, shall, upon request, render technical assistance to local educational agencies, public and private nonprofit organizations, private profitmaking organizations, institutions of higher learning, agencies of local, State, and Federal Government and other agencies deemed by the Secretary to play a role in preserving and enhancing environmental quality and maintaining ecological balance. The technical assistance shall be designed to enable the recipient agency to carry on education programs which (1) deal with environmental quality and ecology and (2) deal with environmental and ecological problems pertinent to the recipient agency.

PAYMENTS

Sec. 7. Payments under this Act may be made in installments and in advance or by way of reimbursement, with necessary adjustments on account of overpayments or underpayments.

ADMINISTRATION

Sec. 8. In administering the provisions of this Act, the Secretary is authorized to utilize the services and facilities of any agency of the Federal Government and of any other public or private agency or institution in accordance with appropriate agreements, and to pay for such services either in advance or by way of reimbursement, as may be agreed upon.

AUTHORIZATION

Sec. 9. There is authorized to be appropriated for the fiscal year ending June 30, 1970, for carrying out the purposes of this Act such sums as Congress may deem necessary.

Appendix B
THE ENVIRONMENTAL EDUCATION ACT

Public Law 91-516, 91st Congress, H.R. 18260, October 30, 1970

AN ACT

To authorize the United States Commissioner of Education to establish education programs to encourage understanding of policies, and support of activities, designed to enhance environmental quality and maintain ecological balance.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Environmental Education Act".

STATEMENT OF FINDINGS AND PURPOSE

Sec. 2. (a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance poses a serious threat to the strength and vitality of the people of the Nation and is in part due to poor understanding of the Nation's environment and of the need for ecological balance; that presently there do not exist adequate resources for educating and informing citizens in these areas, and that concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this Act to encourage and support the development of new and improved curricula to encourage understanding of policies, and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curricula in model educational programs and to evaluate the effectiveness thereof; to provide support for the initiation and maintenance of programs in environmental education at the elementary and secondary levels; to disseminate curricular materials and other information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community, labor, and industrial and business leaders and employees, and government employees at State, Federal, and local levels; to provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance; and to provide for the preparation and distribution of materials by mass media in dealing with the environment and ecology.

ENVIRONMENTAL EDUCATION

Sec. 3. (a) (1) There is established, within the Office of Education, an office of environmental education (referred to in this section as the "office") which, under the supervision of the Commissioner, through regulations promulgated by the Secretary, shall be responsible for (A) the administration of the program authorized by subsection (b) and (B) the coordination of activities of the Office of Education which are related to environmental education. The office shall be headed by a Director who shall be compensated at a rate not to exceed that prescribed for grade GS-17 in section 5332 of title 5, United States Code.

(2) For the purposes of this Act, the term "environmental education" means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment.

(b) (1) The Commissioner shall carry out a program of making grants to, and contracts with, institutions of higher education, State and local educational agencies, regional educational research organizations, and other public and private agencies, organizations, and institutions (including libraries and museums) to support research, demonstration, and pilot projects designed to educate the public on the problems of environmental quality and ecological balance, except that no grant may be made other than to a nonprofit agency, organization or institution.

(2) Funds appropriated for grants and contracts under this section shall be available for such activities as—

(A) the development of curricula (including interdisciplinary curricula) in the preservation and enhancement of environmental quality and ecological balance;

(B) dissemination of information relating to such curricula and to environmental education, generally;

(C) in the case of grants to State and local educational agencies, for the support of environmental education programs at the elementary and secondary education levels;

(D) preservice and inservice training programs and projects (including fellowship programs, institutes, workshops, symposiums, and seminars) for educational personnel to prepare them to teach in subject matter areas associated with environmental quality and ecology, and for public service personnel, government employees, and business, labor, and industrial leaders and employees;

(E) planning of outdoor ecological study centers;

(F) community education programs on environmental quality, including special programs for adults; and

(G) preparation and distribution of materials suitable for use by the mass media in dealing with the environment and ecology.

In addition to the activities specified in the first sentence of this paragraph, such funds may be used for projects designed to demonstrate, test, and evaluate the effectiveness of any such activities, whether or not assisted under this section.

(3) (A) Financial assistance under this subsection may be made available only upon application to the Commissioner. Applications under this subsection shall be submitted at such time, in such form, and containing such information as the Secretary shall prescribe by regulation and shall be approved only if it—

(i) provides that the activities and services for which assistance is sought will be administered by, or under the supervision of, the applicant;

(ii) describes a program for carrying out one or more of the purposes set forth in the first sentence of paragraph (2) which holds promise of making a substantial contribution toward attaining the purposes of this section;

(iii) sets forth such policies and procedures as will insure adequate evaluation of the activities intended to be carried out under the application;

(iv) sets forth policies and procedures which assure that Federal funds made available under this Act for any fiscal year will be so used as to supplement and, to

the extent practical, increase the level of funds that would, in the absence of such Federal funds, be made available by the applicant for the purposes described in section 3, and in no case supplant such funds.

(v) provides for such fiscal control and fund accounting procedures as may be necessary to assure proper disbursement of and accounting for Federal funds paid to the applicant under this title; and

(vi) provides for making an annual report and such other reports, in such form and containing such information, as the Commissioner may reasonably require and for keeping such records, and for according such access thereto as the Commissioner may find necessary to assure the correctness and verification of such reports.

(B) Applications from local educational agencies for financial assistance under this Act may be approved by the Commissioner only if the State educational agency has been notified of the application and been given the opportunity to offer recommendations.

(C) Amendments of applications shall, except as the Secretary may otherwise provide by or pursuant to regulation, be subject to approval in the same manner as original applications.

(4) Federal assistance to any program or project under this section, other than those involving curriculum development, dissemination of curricular materials, and evaluation, shall not exceed 80 per centum of the cost of such program for the first fiscal year of its operation, including costs of administration, unless the Commissioner determines pursuant to regulations adopted and promulgated by the Secretary establishing objective criteria for such determinations, that assistance in excess of such percentages is required in furtherance of the purposes of this section. The Federal share for the second year shall not exceed 60 per centum, and for the third year 40 per centum. Non-Federal contributions may be in cash or kind, fairly evaluated, including but not limited to plant, equipment, and services.

Sec. 3. (c) (1) There is hereby established an Advisory Council on Environmental Education consisting of twenty-one members appointed by the Secretary. The Secretary shall appoint one member as Chairman. The Council shall consist of persons appointed from the public and private sector with due regard to their fitness, knowledge, and experience in matters of, but not limited to, academic, scientific, medical, legal, resource conservation and production, urban and regional planning, and information media activities as they relate to our society and affect our environment, and shall give due consideration to geographical representation in the appointment of such members; *Provided, however,* That the Council shall consist of not less than three ecologists and three students.

(2) The Council shall—

(A) advise the Commissioner and the office concerning the administration of, preparation of general regulations for, and operation of programs assisted under this section;

(B) make recommendations to the office with respect to the allocation of funds appropriated pursuant to subsection (d) among the purposes set forth in paragraph (2) of subsection (b) and the criteria to be used in approving applications, which criteria shall insure an appropriate geographical distribution of approved programs and projects throughout the Nation;

(C) develop criteria for the review of applications and their disposition; and

(D) evaluate programs and projects assisted under this section and disseminate the results thereof.

TECHNICAL ASSISTANCE

Sec. 4. The Secretary of Health, Education, and Welfare, in cooperation with the heads of other agencies with relevant jurisdiction, shall, insofar as practicable upon request, render technical assistance to local educational agencies, public and private nonprofit organizations, institutions of higher education, agencies of local, State, and Federal governments and other agencies deemed by the Secretary to play a role in preserving and enhancing environmental quality and maintaining ecological balance. The technical assistance shall be designed to enable the recipient agency to carry on education programs which are related to environmental quality and ecological balance.

SMALL GRANTS

Sec. 5. (a) In addition to the grants authorized under section 3, the Commissioner, from the sums appropriated, shall have the authority to make grants, in sums not to exceed $10,000 annually, to nonprofit organizations such as citizens' groups, volunteer organizations working in the environmental field, and other public and private nonprofit agencies, institutions, or organizations for conducting courses, workshops, seminars, symposiums, institutes, and conferences, especially for adult and community groups (other than the group funded).

(b) Priority shall be given to those proposals demonstrating innovative approaches to environmental education.

(c) For the purposes of this section, the Commissioner shall require evidence that the interested organization or group shall have been in existence one year prior to the submission of a proposal for Federal funds and that it shall submit an annual report on Federal funds expended.

(d) Proposals submitted by organizations and groups under this section shall be limited to the essential information required to evaluate them, unless the organization or group shall volunteer additional information.

ADMINISTRATION

Sec. 6. In administering the provisions of this Act, the Commissioner is authorized to utilize the services and facilities of any agency of the Federal Government and of any other public or private agency or institution in accordance with appropriate agreements, and to pay for such services either in advance or by way of reimbursement, as may be agreed upon. The Commissioner shall publish annually a list and description of projects supported under this Act and shall distribute such list and description to interested educational institutions, citizens' groups, conservation organizations, and other organizations and individuals involved in enhancing environmental quality and maintaining ecological balance.

AUTHORIZATION

Sec. 7. There is authorized to be appropriated $5,000,000 for the fiscal year ending June 30, 1971, $15,000,000 for the fiscal year ending June 30, 1972, and $25,000,000 for the fiscal year ending June 30, 1973, for carrying out the purposes of this Act.

Approved October 30, 1970.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 91-1362 (Comm. on Education and Labor).

SENATE REPORT No. 91-1164 (Comm. on Labor and Public Welfare).

CONGRESSIONAL RECORD, Vol. 116 (1970):

Aug. 3, considered and passed House.

Sept. 21, considered and passed Senate, amended.

Oct. 13, House concurred in Senate amendments with an amendment; Senate concurred in House amendment.

Appendix C
THE UNIVERSITIES AND ENVIRONMENTAL QUALITY

THE UNIVERSITIES AND ENVIRONMENTAL QUALITY—COMMITMENT TO PROBLEM FOCUSED EDUCATION. A REPORT TO THE PRESIDENT'S ENVIRONMENTAL QUALITY COUNCIL BY JOHN S. STEINHART AND STACIE CHERNIACK, OFFICE OF SCIENCE AND TECHNOLOGY, EXECUTIVE OFFICE OF THE PRESIDENT, SEPTEMBER 1969

. . .

HIGHLIGHTS AND RECOMMENDATIONS

Concern for the serious and complex problems of environmental degradation is constantly growing. All elements of our society share these apprehensions about the future. At the same time our national wealth, resources, and technological abilities should permit the nation to choose from an incredible variety of future options for the quality of our environment and the kind of life we live in it.

The colleges and universities of the nation constitute a powerful institutional resource for education, research and open discussion of our problems and opportunities. At present, except for the prophets of environmental disaster, little of this open discussion of our future environmental alternatives seems to take place at the colleges and universities. There is a national shortage of broadly trained professionals to deal with environmental problems. This report is a study of a few of the vigorous multidisciplinary programs at universities. The aim was to discover what kinds of programs have been tried, which ones have been successful, and how the federal government might encourage the promising efforts.

Extensive discussions were held with faculty, students, administrators and interested people from outside universities about multidisciplinary environmental programs. Detailed on-site studies were made of six programs. We found that there do exist some very exciting and promising programs. Many of these programs face opposition within the university and all lack a suitable funding mechanism. We conclude that *two features are essential for such problem focused programs to be successful*, (although they alone cannot guarantee success):

1. *Substantial or complete control of the faculty reward structure* and
2. *Freedom to be innovative in introducing course material, educational programs, work study programs, and curriculum requirements for degrees.*

We found the student participants in these programs to be enthusiastic and absorbed in their work. An unexpected finding was that more than half the students in such problem focused programs have held jobs for some years and have returned to the university to seek out these multidisciplinary programs because their earlier university education did not satisfy their requirements. It is our feeling that problem focused programs of the sort we examined provide the opportunity many students seek for an education relevant to society's problems, yet thoroughly professional.

We found that federal funds being expended at universities for environmental problems do not encourage problem focused multidisciplinary education and may even discourage the establishment of such programs. . . . [W]e have concluded that new directions are required.

We have therefore recommended that the Federal Government assist in the formation at colleges and universities of Schools of the Human Environment answering the above criteria. Their common purpose should be problem focused education and research directed toward people's need and desire for satisfying life in pleasant surroundings. The historical examples of schools of agriculture and schools of public health illustrate that such efforts are far from unprecedented. Initially such a program would cost approximately twenty million dollars, some of which could be transferred from existing programs. We recommend further that initial funding be done by an ad hoc group drawn from the interested mission agencies and the National Science Foundation and operate under the policy guidance of the President's Environmental Council.

Introduction

We, as individual people, are immersed in our environment. We can change it but we can never escape it. We perceive it most often as physical and biological surroundings and, somewhat less well, as cultural and social surroundings. The growing public concern about the degradation of our physical environment and the hazards to our biological environment is obvious and will not be detailed further. Prophets of environmental disaster on every hand are quite ready to conduct us collectively or individually through a house of horrors of possibilities for the immediate or not very distant future. Many of the outcries of the young and of the minority groups relate to the environment and the quality of life as compared with what these groups intuitively feel are the possibilities for this country at this time. That the concern is much more widespread can be ascertained from the response of the stable middle part of society to such issues as the Santa Barbara oil spill, transportation of dangerous materials, or the use of pesticides.

A very serious risk is that we may follow some few of the traditionally-minded engineers and equate environmental quality with pollution abatement. If pollution were brought under control and clean air and clean water became a reality it is doubtful that the malaise about the quality of life would disappear. In any case, a program based only upon taboos—a program stating that "thou shalt not pollute"—has very limited appeal among all the alternative futures that may possibly await us. We have intervened in the environment whether we wished to or not and our only real hopes lie in deciding how it is we wish to live and inquiring whether we can achieve it or not. . . .

To end and reverse the degradation of our physical and biological environment, to identify the alternative future options open to our society, and to define the common elements of the kind of life to which our society aspires will require strenuous efforts by all the people and institutions of the American society. This report is a brief but intensive study of the contributions that can be made by one of these institutions—the colleges and universities of the United States.

Education has always played a central role in the American dream, and the many and varied uses we have made of our universities illustrate society's faith in education. Of all subjects, it is easiest to get firm and solid opinions concerning the education of the young from all members of society. It should be noted that within the next few years more than fifty percent of the nation's young people will attend colleges and universities at some time. If we are truly concerned about the quality of environment and quality of life this concern must be illustrated and participated in by our educational system.

It is patently obvious, but bears repeating, that the problems and opportunities related to our environment in a growing and increasingly technological society are multidisciplinary as viewed from the traditional dissection of knowledge, engineering, and action into academic disciplines. Many of our most serious problems have arisen because narrowly conceived technological improvements have failed to take account of side effects, deleterious or otherwise, which inevitably accompany a widespread technological change in society. The question then, for universities, is how to pursue multidisciplinary education, multidisciplinary research, and a wide ranging discussion of our human problems irrespective of disciplinary boundaries or professional descriptions. In a way, the use of the word "multidisciplinary" betrays the history of the problem. We are talking about the approach to and the solution for problems and not about the scientific disciplines which can bring to the problem some important knowledge or evidence.

Problem Focused Activity at Universities

In popular discussion of how to solve our environmental problems, the space program or, less frequently, the success of our efforts to solve technical problems during World War II are cited as models. For the universities neither of these examples is particularly relevant; the World War II efforts were conducted under a suspension of the university "rules" in which everything was put aside in favor of this consuming effort with the idea that normalcy would return when the war was finished, as indeed it did for the most part. The space program has been primarily an effort of the Federal Government and industry with important, although modest, contributions fro the universities. More appropriate examples of ways that universities may contribute to the solution of society's problems may be found in the areas of agriculture and public health. Although these problems are somewhat simpler than the complex problems surrounding the environment and the quality of life, these efforts, persisting for fifty to one hundred years, are more nearly comparable to the kinds of problems we face in environmental quality. The schools of agriculture, established under the Land Grant College Act of 1862, have been successful in terms of their original purpose beyond anyone's wildest dreams. The schools of agriculture together with the agricultural experiment stations and the county agricultural agent program have increased agricultural productivity to the point where it, too, is a problem. The gains in public health to which the university schools of public health and medicine made important contributions are too well known to require recapitulation. What is perhaps most impressive is that these units of universities have always had reputations of being second rate intellectual efforts, and, like all prophecies, repetition of such statements is self-fulfilling. That they succeeded in spite of this is a remarkable accomplishment. The common feature of both of these efforts is that they are problem focused.

It will not be easy to begin new problem focused programs at universities, despite the need for trained professionals and the seriousness of the problems. Dr. F. Kenneth Hare, Professor of Geography at the University of Toronto and former President of the University of British Columbia, commented on these difficulties in an open letter:

"Let me start, then, with the question of environmental studies in a modern University. We all know the conservative quality of such places, where nothing can easily be done for either the first or the last time. The *status quo* is defended in depth by the vested interests of a large number of able people. Among these interests are those of the traditional departments and the largely analytical disciplines they profess. Also strong are the numerous special institutes and centers that have got started in spite of the resistance of the departments. When we propose to start up a broad-spectrum, synthesizing effort like environmental studies we run full-tilt into these vested interests.

"We also bang ourselves against the clan-spirit of the traditional faculty groupings. Humanists, social scientists, natural scientists, and professionals like lawyers and engineers may fight like cats within the clan, but they close ranks and hitch up their kilts when someone questions their loyalties. Environmental studies have to involve many of these clans, which are not used to combining in the way required. If we suggest, as I do, that some of them—notably the humanists—may be utterly transformed by such combinations we alarm the timid and anger the Tories among them.

"But the greatest hazard in our path is inherent in Lyndon Johnson's acid query 'Therefore, what?' which he threw at a group of professors who had just briefed him on the Middle Eastern situation. The political interest in the environment demands proposals for *action*—on all time scales, from the immediate assault on pollution problems and other festering sores of today, to the long-term reconstruction of society in a better relation with environment. At present we are not equipped to make such proposals. We are not action-oriented, and on every campus there is a dead-weight of opinion that regards action-oriented programs as hostile to the academic life. . . .

"It must also stress the incompetence of the established disciplines to tackle society's real problem. What we mean by a discipline is an agreed tested body of method—usually analytical—that we bring to bear on problems *of our own choosing*. The essence of our thinking is that we cannot tackle problems that don't fit the competence of our own discipline. It's true that we constantly try to enlarge that competence. Confronted with a new problem, we spare no effort to improve our methods. But if we don't succeed, we don't tackle the problem, and we tend to condemn colleagues who try."

THE DESIGN OF THE STUDY

What has been tried?

It is not the function of the Federal Government to order the universities to undertake specific programs. It is idle to pretend, however, that federal funding policies do not play a very large role in what happens, and equally, what does not happen at universities. The response to various funding programs of the government in defense, space and a variety of other areas have caused universities to erect a wide variety of institutes, centers, and programs to respond to the available funds. In most cases these institutes have been largely paper structures and their impact on the universities and, especially, on the students and the public discussion of the issues surrounding the work has been negligible. Curriculum, faculty rewards, and most of the research has been controlled within the departments representing the narrow academic disciplines. These departments grow narrower and more numerous year by year as the advance of modern science results in increasing specialization. These institutes and centers contrast strongly with the history of agriculture and public health in which curriculum, faculty, and research were centered in schools that were nearly autonomous.

This study set out to examine the range of institutional arrangements that have been tried in dealing with environmental problems and to determine, as nearly as possible, which kinds of arrangements have proven to be successful. We return at the end of the report to inquire how the government funding policies effect university work in the environmental area. It is important that funds made available to work on environ-

mental quality problems be supportive of those efforts likely to result in success, and equally important that they are not wasted on the kinds of efforts that have already proven to be unsuccessful. The urgent and long term needs to examine the quality of our environment and identify what alternative futures may be open to us suggest that a vigorous program comparable in vision to the Land Grant College Act would be extremely important if there were any chance whatever of success.

Society, through its government, does not deal in academic disciplines. It deals in problems and opportunities. Society has a right to expect, as a part of the educational process, discussion of the prominent issues, problems and opportunities of the day, and training of professionals who can deal with these problems on a professional level. A second function of the universities is a prominent role in the long range public discussion of alternative futures. Many of our government policies, now commonplace, have originated in academic discussions of an earlier generation. Yet, except for the doomsayers, discussion of possible future environments among the world's academic community is surprisingly muted. We do not have offered to us the variety of alternatives which may be possible, and from which society and its elected representatives can select pieces to become part of our policy and national goals. The recent establishment of the President's Committee on National Goals is, in part, a recognition of this shortcoming. The increasing concern of the younger generation for the future quality of life in America suggests that the universities could play a very important, perhaps even a crucial part in such a wide ranging public discussion. Thus we certainly ought to inquire as to whether Federal funding policies could encourage this discussion forward and as a minimum ask that Federal funding policies do not discourage such discussion.

Criteria for evaluation

What is it we expect of universities? Can education be all things to all people? How can one maintain rigorous standards? The universities can never respond to a crisis! An interdisciplinary education will sacrifice rigor! These questions and statements, whether from faculty, students, or ordinary citizens, commonly occur. Rather than try to answer them on intuitive grounds we set out to examine some institutions with on-going programs related to the environment and of multidisciplinary content to inquire how well they have worked.

It became obvious early in the study that *two criteria* were of significant interest when examining the on-going programs related to the environment:

> (1) *The degree to which the program, center or other structure participated in the faculty reward structure—including appointment of faculty, promotion, salary, tenure, and other benefits afforded faculty members.*
>
> (2) *The degree to which the program, center, or whatever participated in the generation of curricula, degree requirements and new or innovative approaches to education for these multidisciplinary problems.*

If a program had no influence over either of these areas we found it to be ineffective and powerless within the university. Its contribution to education and public discussion was very limited even though significant research might have been done by faculty members. We also examined the relationship of such programs to real world problems (through work-study programs or other mechanisms) and the degree of participation by students educationally, in research, and in the formulation of policy for the program. . . .

In the discussion and recommendations that follow we have tried, by talking directly to students in environmental programs, to determine their reaction to these programs and to obtain some idea whether, in addition to being effective, these programs answer the deep and justifiable wish of the students to help in the solution of our problems.

Finally, we tried to examine the present participation of the government through its agencies or individuals in the interchange with the universities—faculty and students—in consideration of these environmental problems. The leavening effect of students and others participating in the government has been aptly demonstrated by the Executive Intern and White House Fellow programs. The contribution federal officials could make to the educational process of faculty and students at universities through brief participation there should not be overlooked, and the rejuvenation of a man from an operating agency worn down by long work on persistent and difficult problems should stimulate the agencies involved.

. . .

[*The investigators conducted a mail survey of more than 2000 colleges and universities, from which they selected about 200 for more detailed examinations. Subsequently, they talked to faculty and/or administrators in multidisciplinary programs in over 30 of these schools and made site visits to six of them. In addition, they talked at length with officials from the federal government who were concerned with multidisciplinary programs.*]

RESULTS OF THE STUDY

Institutional arrangements

At almost every university and at most colleges there are an incredible number and variety of interdisciplinary institutes, centers, and programs on almost every subject of human interest. At one major university we counted 157 such free-standing institutes and centers, and at another major university 126. While the rosters of these institutes and centers are frequently impressive, in reality they most often focus around one or two men with an idea and an interest which gave birth to the center. Most of these institutes and centers have in common that they satisfy neither one of the criteria mentioned above—that is, they have no influence over the faculty reward structure and little or no influence over curriculum. Research done under the auspices of institutes or centers is most frequently done within existing departments and it is only the sum of research that is interdisciplinary because each individual project is divided into the disciplines and pursued independently. This widespread pervasive experience with the "paste-on" institutes is unimpressive, and it is clear that this kind of institutional arrangement simply does not work at universities if one wishes to educate new professionals, to involve students with the topical material, and to have free-ranging discussion across disciplinary boundaries take place.

Of the six programs we examined in detail, two of them had their origins in city planning and urban studies efforts, two of them had their origins in sanitary engineering and, to a lesser degree, civil engineering, one originated from a combination of biology, engineering and public health interests, and one grew from diverse sources mostly in engineering. These programs having their origins in engineering still exhibited a strong attachment to the engineering schools and had as their principal features strong science and engineering together with operations research and systems analysis efforts. Programs originating in urban studies contained a much larger element of social science involvement extending well beyond economics into psychology, sociology, and other areas. Several of the programs were connected with schools of public

health and medical schools, although in most cases this is a somewhat uneasy relationship at present and no professional medical people seem to be directly involved with the program on a continuing basis. There were minor contributions to some programs from professional schools of public administration, law, and industrial relations. Most of the program leaders hoped for further involvement and indicated some enthusiasm on the part of the professional schools. Lack of funds was most often cited as the reason that the arrangements had not proceeded further. A disturbing note was the lack of humanists with these programs. Since perception of our environment is dependent so strongly on our ideas of aesthetics, social aspirations, and beliefs, it seems important that humanists be involved in consideration of the environment. Again, many program directors felt this need and hoped to add humanists at a later date. Particularly when other countries are considered, it is essential that humanists be involved because foreign cultures frequently do not regard their environment in the same way that Western cultures do.

The formal institutional structures of these six programs differed considerably: one was a Center, one an Institute, one was a Program, one was a Department, one had no name but was centered around a department, and the least effective one had no name but included a center and involved members of several departments. What all of the effective programs shared were the two features mentioned above; they had substantial influence or complete control over faculty hiring and subsequent promotion and rewards, and considerable flexibility in introducing new course work and curricula, and flexible degree programs for students working in the problem areas. In most cases they also had the direct interest of one of the more senior administrators of the university who frequently had helped foster the program and who almost always helped to provide both resources and protection from traditionally minded faculty members.

It seemed obvious to us, and was mentioned by at least one of the program directors, that possession of their own resources and considerable influence in the faculty and curriculum areas made for a more harmonious relationship with the traditional departments and schools of the university. When the program was in competition for the scarce resources of the university, the traditional departments were frequently arrayed in opposition to the problem focused programs or institutes. The departments of the traditional disciplines did not actively support these programs. There were individual participants from the departments interested in and actively participating in the programs, sometimes with part of their salary paid by the program and sometimes not. But there was almost a sense of conspiracy among these participants as if problem oriented programs were somehow at odds with the purposes of their discipline departments.

The physical plant provided for most of these efforts, except for that one which was a department, were generally makeshift and somewhat inferior and frequently scattered widely over the university campus. This was noted as troublesome. As many of the program directors pointed out, multidisciplinary efforts thrived best if the participants were in fact brought together on a regular basis so that they became accustomed to conversing with one another. One program at a major university had provided extensive quarters for its multidisciplinary effort but the program was sufficiently new that we did not elect to examine it in detail. No doubt the newness of the programs has, in some cases, prohibited any efforts to provide more suitable accommodation in some central location. That the programs remain as vigorous as they are without central accommodations is a tribute to the strength of the ideas and the vigor of the participants.

These programs and efforts are problem focused efforts as contrasted with the discipline and methodology focus of most university departments. This has deep and comprehensive implications for education, for faculty, and for the ultimate goals of the educational institutions themselves. It is a mistake, however, to think that they are unprecedented. We have already cited as examples the schools of public health and the schools of agriculture. There are other analogies to be drawn to the professional schools of business, medicine, and law. At the universities we examined, the programs focused on a broad range of environmental matters, but within this general framework—somewhat vague and all-embracing—centers of intellectual activity grew up around the interests and abilities of the people who were there. This is appropriate and it would be a mistake to try and mold all these institutions toward some particular purpose. Any hope of eventual success in solving our problems in environmental quality requires a great variety of specific problem focused style of activity. The institutions at which such efforts are mounted may require somewhat different specific institutional arrangements. We came to conclude only that problem focused efforts have an appropriate place in education, that the places we visited were vigorous and promising, and that the two criteria mentioned above are *essential* for any hope of success even though they cannot guarantee it.

In the course of our study we had an opportunity to examine a report by Eric Jantsch of the OECD entitled "The Emerging Role of the University." This study was prepared during a year-long stay at the Massachusetts Institute of Technology and represents considerable study and conversation about the future of American universities. We found this study to be particularly thought-provoking and agree with many of its conclusions. In terms of institutional arrangements, the following comments by Jantsch are indicative of what we felt to reflect the motivation and aims of the best programs we have seen in operation:

"We are living in a world of change, voluntary change as well as change brought about by mounting pressures outside our control. Gradually, we are learning to distinguish between them. We engineer change voluntarily by pursuing growth targets along lines of policy and action which tend to rigidfy and thereby preserve the structures inherent in our social systems and their institutions. We do not, in general, really try to change the systems themselves. However, the very nature of our conservative, linear action for change puts increasing pressure for structural change on the systems, and in particular, on institutional patterns.

"We are baffled by the sudden appearance of such pressures for change in the educational system, by student unrest, and by the notion that the current type of education may no longer be relevant. We are confused by the degrading side-effects of technology on the systems of human living, in the cities as well as within the natural environment. And we are ridden with doubts about the effectiveness of decisionmaking processes dominated by short-range and linear thinking and about the piecemeal and passive way in which scientists and engineers respond to them. Through its three functions—education, research, and service—the university is deeply affected by all of these pressures for change. To live with them, to absorb them and even make use of them, requires a new purpose and a new structure for the university.

"Throughout this paper, the belief is held and substantiated that the disruptive forces threatening the university—and, indeed, society itself—may be expected to act as cohesive forces once a number of structural changes have been introduced,

both within the university and in its relationships with society at large and with the various elements of the surrounding community.

"It is necessary to deal with causes, not with symptoms. The general concern over the university, and above all the students' concern cannot be resolved with patchwork and compromising, shock-absorbing strategies. These are no clear-cut problems to be solved—the classical single-track and sequential problem-solving approach itself becomes meaningless today. This may come as a cultural shock to our pragmatic and efficient society, valuing nothing higher than 'know-how'."

Faculty

We talked to a great many faculty members at the six universities we visited and a good many others in Washington. It became obvious that there was a fundamental difference in career goals between those associated with problem oriented programs and the more traditional faculty devoted to disciplines. One man with particular technical preparation may choose to devote himself to the uncovering of new knowledge in the traditional academic mold and the improvement of his discipline while another man with precisely the same preparation may devote himself to a broad problem area. This difference of attitude is institutionalized in a traditional academic department so that, even though individual members may have interests in problem areas, the sum of the department has a strong vested interest in preserving the study of the discipline, the improvement of methodology, and the pursuit of new knowledge wherever it may lead.

Basic research is not a continuous process but rather a continuous succession of choices. Will I follow this direction or some other direction? A problem focused man will take that direction which he expects, rightly or wrongly, will lead closer to the solution of problems in which he is interested, whereas the man devoted to the uncovering of new knowledge will take that direction which he finds most interesting. As scientific knowledge accumulates and academic disciplines fractionate into ever narrower professional specialties the institutionalized differences between these two fundamental attitudes become clearer and more irreconcilable than ever. Several faculty members we met emphasized this basic difference in career goals. When problem focused programs were clearly separated institutionally from those with discipline goals the faculties got along better, talked more freely together, and even worked together on some specific topics. The uneasy relationship which exists between the two goals is clear from hiring practices. If the chairman of a discipline oriented department is faced with the choice of two men, one with a problem focus and considerable experience, and the other with a narrow disciplinary orientation and much accomplishment in basic research in his specialty, the chairman will invariably choose the latter.

The traditional rewards of the academic profession have been most commonly given to those with a discipline orientation and perhaps this is appropriate. We found that the faculty with a problem focus were not especially concerned about this kind of academic standing and reward structure; but for obvious reasons they were conscious of the university reward structure including appointment, promotion, tenure, and salary levels. There may well be some men who would like to pursue both kinds of activity; however we are skeptical that either activity can survive unless it has a corps of dedicated people clearly identified with it and who recognize one or the other as their home base.

Many of the faculty members associated with these problem focused programs have had experience in government, in industry, or in other service activities. This contact seems especially valuable and ought to be encouraged by any such programs that are initiated. Outside people who came in as instructors from time to time seemed also to be useful. In one such program the mayor of a major city was coming to learn as well as teach in the program.

Those faculty associated with the problem focused programs numbered more engineers among their members than any other collection of professionals, although there were biologists, physicians, economists and other social scientists, and a sprinkling of professional people such as lawyers in some programs. In our opinion most of these people were extremely able. Many of them are among the leaders in their field. In some cases this could be ascertained by their academic standing in their disciplines at the time they elected to engage more strongly in problem focused work. In other cases the evidences were practical ones. For example, one man was actively pursuing game theory as a method of discovering how different groups in the society thought government policy was made. The evidence of his ability in the field was that an incredible variety of city and local government agencies (and 26 foreign countries) have attempted to hire him as an advisor. He now has to decline most such invitations because he simply does not have time to pursue his own work nor his interests in educating his students. Other similar examples could be cited. The programs that had been going for some length of time seemed to attract considerable project support from industry and government at state and local levels. This is direct market place evidence of the success of these programs. It would be a mistake however to attempt to run programs permanently on specific project support if, as we believe, the society as a whole has an interest in the educational aspect and the free discussion aspect which are not served by the short term problem focus usually supported by industry and local governments.

Problem focused work is admittedly difficult. It requires multidisciplinary efforts or, as one student put, "a-disciplinary." A number of impediments were proposed to us from time to time by discipline oriented faculty. For example, it was suggested that faculty will work across disciplinary lines on projects if money is available. While it is true that in times of tight money supply faculty may look eagerly toward any monies that are available, it is not true that one can simply bring members of different disciplines together and immediately expect successful joint efforts. The most successful efforts were among men who had spent some considerable time working together.

Those trained to different disciplines develop a collection of technical terms, ways of approaching problems, and analytical tools which differ more in description than in substance. In the most successful programs a common language had developed after some length of time. However the language problem was solved, it was not solved instantaneously by bringing together a variety of disciplines. After a core group has developed a common language it is much easier to bring in an occasional visitor from some relevant discipline who can, in effect, have the proceedings of the group translated for him until such time as he understands how they communicate with one another. The students who participate in such programs have less difficulty since they begin with a multidisciplinary approach.

Another common allegation was that the faculty would get out of date in such a program. There is some evidence that in the case of the schools of public health some faculty did fall behind the advances of relevant disciplinary fields. One cannot guarantee that this will not recur. We can only state that we found the participants in these environmental quality pro-

grams fully up to date with developments in the disciplines with which we were familiar. In areas such as systems research, game theory, and computer techniques the faculty were developing new methods. In any case, there is no reason why, given satisfactory institutional separation between the people dedicated to problem solving and those dedicated to basic research, a peaceful interaction cannot take place in which both groups stay up to date and are stimulated by each other. This kind of symbiotic relationship was developing at several of the institutions we visited.

Finally, several famous members of the scientific elite have suggested that there is not a supply of able people willing to engage in activities of this kind. We have simply not found this to be true. There are far more people willing to engage in this activity than can find support either to teach, do research, or work on problem focused activity related to environmental quality. It is interesting to note that we have received several unsolicited resumes from young scientists at three of our leading universities who have heard of our summer study and wish to be brought to notice of these programs where they might secure jobs in the area. The resumes of these young men suggest that they are among the very brightest available from physics, molecular biology and other fields.

In summary the faculty seems well qualified. The supply is abundant for an expansion of ten times or a hundred times the present level of activity. What is lacking is an institutional willingness to try and, most of all, there is a shortage of money with which to start. We will return to this subject in the findings and recommendations.

Students

One of the myths, often repeated when discussing interdisciplinary programs, is that if students do not have the proper disciplinary training they will not be prepared for careers awaiting them in the "real world." The students with whom we spoke disagreed. As stated in the Cox report on the Columbia disturbances:

"The simple fact is that a constantly growing proportion of the best students does not look forward to careers molded along the established lines of professional or business success. The point can be proved statistically, but it is enough to illustrate it by reference to the tremendous interest in social service work and the Peace Corps and conversely to the difficulties established business firms and the professional advisors now face in recruiting."

The world to which the PhD student is headed is one concerned with problems, and not organized along disciplinary lines. There is a variety of jobs awaiting such a problem oriented student. For example, there are numerous government agencies currently faced with an alarming lack of trained individuals who can competently deal with problems of the environment. At best, we have managers trained in a discipline and with a tendency to view all problems that come under the auspices of their agencies in terms of that discipline. There will always be agencies and industries interested in hiring people to solve problems. The Vice Presidents for Research of major corporations told us that they desperately need people with broad training in the environment. What better source of manpower, than those who have trained for just this purpose?

It is even possible that this is a moot question. For more and more today, we find that students are less interested in the material values than their parents. We have spawned a generation with a "social conscience." Unlike their parents, their generation was raised without the devil of depression in constant watch. Many are not concerned with the security of a high paying job. Instead, they have found that what is most important to them is to divert the world from what they see as a path toward certain doom. That, in the student's view, the accepted academic disciplines have not met this need is evidenced by the findings of Dr. Benson Snyder, a psychiatrist at MIT. He has reported that a large fraction of the very brightest graduate students admitted to a scientific education either drop out or are much dissatisfied with education goals. From performance data and in-depth interviews he concludes that these are not only among the brightest students but constitute those with the greatest depth of concern about society's problems. . . .

If the universities could overcome their innate conservatism by creating curricula which the students would find more relevant to the problems existing in the world outside the universities, then it is possible that a good deal of unrest on the campus would vanish. At least the students with a legitimate concern toward their education would find that the university would indeed allow them to go into fields of deep social concern. We found evidence of this at all the campuses we visited. Almost all the students with whom we spoke were products at the undergraduate level (and many at the Masters level) of a strict academic discipline. Each of them has expressed a degree of dissatisfaction with his narrow discipline training. They were enthusiastic about the programs in which they were participating and expressed concern at the lack of such programs at other colleges and universities in the United States. None of these students worried about future careers. In many instances they voiced the desire to teach at the university level in programs of this kind.

It is of particular interest that a majority of the students with whom we spoke had had some experience in the "real world." Some had returned to the university after as long as fifteen years. At one such university with a program in city and regional planning, a new PhD student this fall will be the former Model Cities director of the neighboring large city who will be entering the program at the age of 50. These experienced students expressed little concern over their future. They had been working on society's problems and had come back after a realization that they needed problem-oriented training. They felt, to a large extent, that their disciplinary training had been inadequate in preparing them to deal with problems outside the university.

In many cases students provide the cohesion for the group which the faculty are unable to contribute. T[illegible] programs in which the students had a strong voice in direction and goals seemed to work the best. It was the students that were truly inter-disciplinary. With their problem oriented viewpoint they provide an important channel of communication between the participating faculty members. Because it is the students' goal to receive a true multidisciplinary, problem oriented education, they often demand there be a maximum amount of interaction between faculty and students and faculty among themselves.

It was only if the program functioned as a degree granting institution that the student gained the maximum benefit. The problems of such a Center when it existed only to supplement that student's education in an academic discipline were severe. The students at a large Western private school with an urban oriented program complained that oftentimes they were not able to devote the amount of time they wished to programs of their Institute. This was because many of them, especially the Masters students for whom no degree is granted, were required to take courses to satisfy the established curriculum of their discipline at the same time that they were participating in programs of the Institute. Because of the program's flexibility, which included lack of deadlines

and examinations, the students were forced to devote more time to those courses required in their disciplines which have such deadlines. Any benefits from participation in such an Institute will almost certainly be negated if the student is forced to place his work at the Institute at the end of his list of academic priorities.

Of the three major roles of the university—education, research, and the on-going discussion of problems—it is certainly the education of students with problem oriented training which is one of the most valuable results of a program concerned with environmental quality. The fear that a student trained in such a program will be amateur rather than a professional is not echoed by the students themselves. These students, especially those with extended work experience, know that it is not necessarily true that a generalist equals an amateur. The students expressed confidence in themselves and in their ability to find jobs after they had completed their university education. They were excited about their programs.

Curriculum

There is strong evidence in our findings that the programs which have control over their curriculum are the most successful. The optimal arrangement is one in which the program or center offers a degree to its participating students. When this is the case students will not find it necessary to satisfy the academic requirements in a department in addition to any which may be attached to the program. Some of the programs did offer their own degrees. Others overcame the problem by making use of the committee or individually planned degree. Thus, the students were able to devote their time to interdisciplinary programs concerned with the environment.

An Environmental Quality Program should have a mechanism through which courses may be created and added to the curriculum of the students. It is neither necessary, nor desirable, that the students' entire curriculum be offered under the auspices of the program. We are, after all, looking for interdisciplinary programs and the students should take advantage of the wide range of courses offered throughout the university. However, it will not be entirely answered by those courses already in existence. Many of the programs offered core seminars as the basis upon which the student built his curriculum. In one case, these core seminars served as a meeting ground for interaction between students and faculty. There was no subject matter attached to the seminar until the faculty and students together decided what it should be. In all of the other programs students and faculty were free to create courses which they felt necessary for their education.

Whether or not a degree was offered, the students were allowed a wide range of freedom in deciding upon their curriculum within the programs. In the cases where degrees were offered, students were encouraged to tailormake their own curriculum, usually in conjunction with a faculty adviser. One student at a small eastern school commented that never in his educational experience did he feel, as he felt now, that his individual desires and talents were taken into consideration in formation of his degree program. It was at this same school that the students commented as a group on the absence of competition within the department. They explained that the range of problems dealing with the environment was so large that there was no reason for them to compete either for thesis topics or for jobs afterwards. They were excited by the individual freedom allowed them in the pursuit of their education.

As students often pointed out, absence of set requirements allowed them to take a wide range of courses throughout the university, thus giving them contact with the various disciplines. One student remarked that the value she found in taking courses in other disciplines was that she was learning how to communicate with those people still lodged in disciplines. In no case did we find students who felt themselves unable to compete in these disciplinary courses. It is through this contact that the students become truly interdisciplinary. Since they had become used to participating in courses across the academic spectrum, they had much less difficulty than the faculty attached to the programs in communicating across disciplinary lines.

There was some evidence that courses offered by such programs are taught differently from those offered in the traditional academic disciplines. Seminars and workshops were the common course structuring. But much more so than in the traditional disciplines, the seminars tended more toward group interaction and "T group" experiences. It was a feeling expressed many times by the students that they had little patience with faculty members who made rare appearances at the Center. To the extent that research was a part of their training the students welcomed it. But they stressed that they did not want a faculty member involved in the Center who was primarily interested in his own individual research and who spent most of his time on it. A faculty member heading an undergraduate program in the urban area at a western private university felt that the pressure on him was much more than he had experienced in any other academic situation. The students demanded that he be present sometimes just as a sounding board for their ideas. He felt that many faculty members had a fear of this interaction and thus shied away from participation in such vigorous programs.

In particular, the students should have some practical experience in working out the problems of the "real world." Whether it be in an urban semester program, a work-study program, this is experience that will be invaluable to the student once he has finished his studies. The university will always, to a certain extent, be insulated from society outside its boundaries. Only through the instigation of such work-study programs will students be allowed the experience of actual problem solving.

THE ROLE OF FEDERAL FUNDING

In considering the role of federal funding in environmental quality programs it is important that the Federal Government, and specifically those agencies concerned with problems of the environment, not fall into the trap of funding disasters and withholding money from those programs with the greatest chances for success. A common complaint we heard at all the universities we visited was that there was a general lack of funds available for such wide ranging interdisciplinary programs. What the heads of most of these institutes found themselves doing was going through a process of genteel lying and cheating in order to get money for their programs. Often times, it was necessary to emasculate the programs in order to suit the specifications for federal funding.

We have not attempted a detailed study and analysis of the Federal Government's past efforts to fund interdisciplinary research and education. Such study has been made by Dr. D. E. Cunningham under the auspices of NASA. . . . His findings have helped shape our conclusions and recommendations.

The most common method of funding is through individual research grants or project grants. What the Federal Government is in effect doing is encouraging the creation of "paper institutes." The money, usually in the form of project grants, is awarded to the institute and each professor quickly takes

his share and returns to his department for his individual research. After a certain length of time the professor may be expected to return with a neat paper of research results. This can hardly be considered as a satisfactory model for interdisciplinary research, and there is certainly no provision for the training of qualified individuals who will deal with environment or for the on-going discussion of environmental problems. In essence, the funding patterns are not demanding of any commitment by the institutions. Any interdisciplinary work which exists today is largely a result of sheer will on the parts of the participating individuals.

Another result of such funding patterns is that there is a lack of continuity, of research and of training. Once the project has been completed the faculty members working on it disband the group and seek new funding for new projects. Thus, the faculty members receive an excellent training on how to fill out federal funding applications.

One myth which has been built into the system of federal funding is that research and training can be adequately separated. Especially in these interdisciplinary areas this is just not the case. There have been a few training grants for individual students who wish to pursue particular projects. But how can they be trained in the area of environmental quality if there is no one on the faculty of the university to train them? These training grants force the student to identify himself with a particular academic discipline and often times he is diverted from his original purpose and the purpose for which the training grant was awarded.

The funding patterns as they exist today do not seem to promote an interaction between the funding agencies and the universities—an interaction which could prove to be rewarding for both. The students could receive valuable experience through contacts and work with agency officials. Especially if a program is to be problem focused students should be exposed to the problems with which the Federal Government is faced. Further, many agency officials could benefit from the new ideas which come out of the interdisciplinary programs in environmental quality.

There is a broad need for programmatic support for these environmental quality programs. The Federal Government must attempt to select those programs which have the greatest chance of success. According to our findings, this would mean that the Federal Government should look for programs which have a strong hand in the faculty reward structure and over student curriculum. In addition, the agencies intending to do the funding would be wise to look for a strong administrator with some overall responsibility for the program. It is usually through the presence of such an administrator that the program has managed to establish itself within the university structure.

The Government could play an important role in the institution of these programs by contributing seed money for the hiring of faculty and for planning of new programs. Once the program has been in existence for a specified length of time this money could be replaced by money from the university. But money, which is so desperately needed for the institution of any such institute or program, will most likely have to come from the Federal Government since most universities cannot provide initial funding. If the program has a good faculty and a good plan of action, and if it can begin to attract students, then this is the recipe by which state and private sources will begin to divert money into the program.

It might also be wise for the Federal Government to establish some policy regarding educational innovations in such programs. Some educational money should be applied to these new interdisciplinary areas for experimentation with new methods of teaching and research. This would not be continuing funding but would provide for the preparation of new methods of teaching, course materials, and faculty free time to prepare innovations.

Student funding should not be ignored. The Federal Government and many industries are desperately in need of the people who will be trained by the program. It may well be that these people are as valuable to society as those in the medical sciences and perhaps the Federal Government should provide similar incentives and support for them. One common thread we found among the students in all the programs was that a majority of them returned to these programs after an extended amount of time of outside professional experience. Many of them had wives and children and were giving up lucrative jobs in order to return to the university. The Federal Government should consider funding support for such people. Continuing and re-education of such experienced people is in the best interest of society. Currently the amount of money they receive on training grants cannot adequately support them and their families. We do not want to pre-select out those people who have valuable experience to contribute to the program. This is, in effect, what is happening when we offer a graduate student with a wife and two children three thousand dollars a year. It is not necessary that such student support be only grants and loans. The work part of the work-study program could enable students in problem-oriented programs to earn much of their own way.

FINDINGS AND RECOMMENDATIONS

We conclude from the above that the problems are serious, that faculty and students are available for some new and imaginative efforts, and that present federal funding policy works in opposition to funding the kinds of efforts that seem to be successful.

We recommend that the Federal Government support formation of Schools of the Human Environment at colleges and universities. These programs should be expected to vary in their emphasis from university to university and from region to region. Their common purpose, however, should be problem-focused education and research directed toward people—their need and desire for a satisfying life in pleasant surroundings. Such schools or programs can begin the task of providing trained professionals to work on environmental problems, help to define what is possible and how to get it, and provide opportunities for the justifiable desire of many young people to devote their attention to environmental problems.

The Federal Government cannot start these efforts alone. Colleges and universities should exhibit their commitment to environmental programs with people and funds. *In particular we recommend that such programs meet the following criteria:*

(a) Substantial or complete control of the faculty reward structure and

(b) a relatively free hand to be innovative in introducing course material, educational programs, work-study programs and curriculum requirements for degrees.

(c) The focus of environmental programs should be expected to vary from institution to institution and the funding agencies should ascertain only that there is problem focus to the activity (whether technological forecasting, pollution abatement, urban planning, long range society planning, or a number of other continuing problems).

1. *We recommend that funding programs include at least the following items* (but not necessarily be limited to them):

(a) Continuing core funding for the program as a whole. . . .

(b) Seed money for faculty salaries. . . .

(c) Seed money for educational innovation. . . .

2. *We recommend that work-study programs for both faculty and students be a prominent part of environmental programs.* In the effective programs currently underway it was obvious that the real life experiences of both faculty and students played an important part in their contributions to the programs and to the educational experiences of themselves and others. Since we are concerned with real-life problems it seems obvious, and was borne out by our study, that work-study programs are extremely useful. They are useful to the students as part of their education, to the faculty, in renewing their contacts with the actual problems, and should be of considerable use to the government by bringing in vigorous faculty and students for short periods and returning their own officials to the university both as students and as teachers.

3. *Student educational support is essential as a part of environmental programs.* . . .

4. *Recommended funding levels.* We have felt that the interest and the able professionals are available to expand the presently effective efforts by ten to a hundred times. We conclude that somewhere between ten and twenty major universities have programs sufficiently far enough along to be ready for funding. The cost of such a program depending on size and extent would range from two hundred thousand to about eight hundred thousand dollars per year including all the features mentioned above. In addition, we recommend planning grant support for some of the two hundred or more universities who have expressed vigorous interest in this area that are not sufficiently far along to offer a definite and fundable program. Such planning grant support probably should be $50,000 or more for a one or two year period. Thus we recommend that approximately twenty million dollars be devoted to this program at the outset. Because certain aspects of the program should diminish in cost after the initial grants it is not likely that these funds need grow at a substantial rate in the first few years. It is our firm opinion that the government would get more return for its money in programs of this sort than they now get from some of the existing training grants and contract research. . . .

Therefore the recommended twenty million dollars does not need to be entirely new money. A crude estimate is that about one half would be new money and about one half could be diverted from existing funds expanded under titles related to the environment.

Funding procedures should involve those agencies with a mission for problems of the environment. They should certainly include the Departments of Interior; Transporation; Housing and Urban Development; Health, Education, and Welfare; Commerce; and Agriculture. The National Science Foundation should fund programs that are not specifically a part of any agency responsibility but show promise for the future. The agencies mentioned have been notoriously ineffective (with a few exceptions) in funding institutional arrangements at universities. We therefore recommend funds be assigned by these agencies to this program and that some senior people from these agencies be brought together under the policy guidance of the President's Environmental Quality Council with representatives of NSF, NASA, or DOD to take a lead role in the initial funding in a common effort embracing all the agencies. Eventually all the agency members should return to their own agencies to constitute a Bureau of Institutional Funding operating directly under the Secretary of the Department. . . .

Appendix D
A STATE MODEL ENVIRONMENTAL EDUCATION PROGRAM FOR REGION II, U.S.O.E.
(Excerpts)

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CHAPTER II—NEW JERSEY RESOURCES AND FACILITIES

Beyond question, New Jersey is the ideal location for a regional model demonstration program and laboratory in environmental education. Having 941.8 people per square mile, it is the most densely populated state in the Union. The northeastern section of the state is geographically the center of a population density of 15 million people living within a radius of 60 miles and including parts of New Jersey, New York, Connecticut, and Pennsylvania. In addition to being the most urbanized state in the country, it is also the most industrialized. Because of these two factors New Jersey can aptly be termed a microcosm of the present and future problems facing the entire nation.

Furthermore, New Jersey has shown national leadership in the field of environmental ecological education and is able to provide a network of qualified environmental educators, established teaching and training facilities, and diverse learning environments. Finally, the state has unique and comprehensive representation of those powerful vectors of potential change, viz. business and industry, for within its borders lie a spectrum of these interests ranging from farming and extractive mining, space research and development, to the refining of fossil fuels.

In this setting, it is imperative that the state mount a viable program of environmental education. To this end, the State Department of Education has developed, during the past three years, a *New Jersey Plan for Environmental Education*.

Knowing that New Jersey must move ahead, the State Commissioner of Education, Dr. Carl L. Marburger, has endorsed the *Plan*. If the *Plan* is implemented, it can serve as a model for the other states and particularly for Region II of the United States Office of Education. On March 25, 1970 Dr. Marburger proposed, in a letter to Dr. James E. Allen, Jr., U.S. Commissioner of Education, that New Jersey serve as a *National* Center for Environmental Education. In recent meetings with personnel in Dr. Allen's office it has been determined that one state in each of the ten regions established by the U.S.O.E. might develop a model program for its particular region. Therefore, it is proposed that New Jersey be established as the demonstration model state for Region II. . . .

CHAPTER III—OBJECTIVES

The intent of the proposed New Jersey Environmental Education Model Center of Region II, U.S. Office of Education is to contribute to the following national goals:

1. "Fulfill the responsibilities of each generation as trustees of the environment of succeeding generations.
2. Assure for all Americans safe, healthful, productive and esthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation of health or safety or other undesirable or unintended consequences.
4. To preserve historic, cultural and natural aspects of our national heritage and maintain whenever possible an environment which supports diversity and variety of individual choice.
5. Achieve a balance between population and resources which will permit high standards of living and wide sharing of life amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

It is felt that the focus of the New Jersey objectives, which contribute to the achievment of national goals, is as follows:

To enable industry, education, government, other groups and individuals to work cooperatively, and to pool their resources in:

I. Creating environmentally literate citizens who:
   - (*a*) Understand their interdependence with the environment
   - (*b*) Accept responsibility for environment
   - (*c*) Are knowledgeable of environmental problems
   - (*d*) Actively participate in the solution of environmental problems
   - (*e*) Contribute to prevention of future environmental problems

II. Increasing the usage and diversity of educating environments

III. Providing leadership for research and development, professional and non-professional training, and curriculum change

IV. Development of a procedure for the permanent coordination of the educational activities of public and private organizations, agencies, groups and individuals.

To achieve these objectives, the proposed plan will be implemented through three components: a Technical Advisory Committee; an Environmental Education Model Center; and a structure of Operational Models.

CHAPTER IV—A COOPERATIVE EFFORT

If environmental ecological education is to be the education for the survival of the United States and the World community, it must be developed in all sectors of the population. This chapter deals with the total effort needed to expand present isolated programs into a statewide matrix which will serve the needs of New Jersey and also serve as a model program for Region II, U.S.O.E., and the Nation.

To achieve the objectives outlined in Chapter III, a model program will be developed to carry out the necessary research, development, and implementation of a variety of activities providing for a unified, coordinated, viable design for change from the status quo to an acceptable program of action which will produce the desired changes in attitude, and use of the environment, as well as provide a worthy heritage for future generations.

The appointment of a high level, broadly representative Technical Advisory Committee which will serve, in a sense, as a board of directors for the model center is the key to the entire enterprise. This committee will be the vehicle through which communications will be expanded and will allow for an open exchange of problems confronting many sectors of government, industry, and education.

Legal problems, factual studies, long-range plans, projec-

tions for future development, economic forecasts and the wide range of information necessary for decision making are produced by agencies and groups represented on the Committee.

A major task of the Technical Advisory Committee and the staff of the Model Center will be the pooling of information, its evaluation and subsequent conversion to courses of study. These courses of study and adjunct curriculum materials will be disseminated and made available to public and private schools, institutions of higher education, public seminars, and news media. The Center will also provide curriculum models and materials for industrial, business and intragovernmental technical training sessions.

Teaching materials and training devices are being developed and tested throughout the country. The Center will collect, for its reference library, much of the material developed by governmental agencies, industry, Title III projects, local, county and state school departments. The staff and consultants will evaluate this material and disseminate their findings to appropriate audiences. As a clearinghouse, the Center will carry a heavy responsibility for dissemination.

The Center will sponsor leadership training seminars for business, government and school administrators, teachers, commuity groups, environmental-interest organizations and associations and others. These programs may be conducted at the Center or by contractual arrangement at one of the sub-centers, industrial training facility, college or university.

Exchange of information with other states and territories in Region II will be accomplished through conferences, newsletters, staff exchange, fellowship training programs and dissemination of model curriculum materials and media.

The Center will designate several of the sub-centers to achieve particular objectives. Two sub-centers, which presently conduct in-service teacher training environmental ecological education programs, will be designated as the extension facility to plan and conduct a series of workshops, seminars and training sessions. Other sub-centers will be identified as curriculum development and testing stations, working in cooperation with the staffs of the Model Center and the other sub-centers to allow for maximum communication, evaluation and implementation.

Community College Manpower training programs will be developed as part of the total state plan with the Center serving as a coordinating and dissemination facility.

The above major thrusts of the Technical Advisory Committee through the Center staff and the network of sub-centers will be organized to meet the common and specific environmental needs of various sectors of society.

. . . [T]he following is a brief list of the major sectors of concern together with their more critical individual requirements.

General public needed—

Public forums on current environmental problems of community, state and nation.

Local radio and television programs that educate, not titillate.

Informative news journalism.

Environmental ecological training sessions and conferences for journalists, television producers, radio programmers and other media specialists.

A central source of reliable information on environmental issues and programs.

An awareness on the part of the general public that it can and must effectively act regarding environmental issues.

Business and industry needed—

A viable working relationship and creative exchange between business/industry and education.

Translation of industry's data, planning and technology into relevant curriculum materials.

Preparation and training of environmental ecological specialists for business and industry.

Conferences, seminars, and symposia on environmental affairs for all levels of management.

Elementary and secondary education needed—

Teachers, school administrators, and school board members who understand the societal significance of environmental ecological education.

In-service training programs and facilities which will offer teachers exposure and practice with experimental ecological curriculum materials, teaching aids, instructional techniques, and educating environments, other than the classroom and school building.

Curriculum materials which are attractive to teachers because they are relevant and immediately adaptable to existing curricula and are attractive to students because they are relevant and replete with direct, often self-guiding learning experiences.

Vocational high school training in environmentally related occupations.

A central servicing agency able to provide environmental ecological information, consultation, curriculum materials and multi-media teaching aids.

Higher education needed—

A well organized and stimulating required environmental ecological studies course for each college student.

New interdisciplinary majors at the undergraduate and graduate levels.

Expansion of independent studies programs and encouragement of individual projects related to environmental quality.

Environmental technician training for students of two year community colleges.

Continuing education and refresher courses on environmental issues and processes for graduates working in the fields of business, engineering, law, medicine, government, etc.

Conferences, seminars and symposia on environment for diverse groups of faculty members to facilitate the exchange of ideas and to sensitize these key individuals.

Adult education needed—

Survey-type and specific course offerings on environmental subjects.

Preparation of adult educators to teach such courses.

Use of local community business leaders, environmental specialists, and governmental officials as educational resources.

Development of more sophisticated curriculum materials and teaching aids for adult level courses.

Active involvement of the adult sector of a community in its local environmental problems to effectuate change.

Governmental agencies needed—

Active leadership and cooperation of governmental agencies, industry, business and education to insure environmental quality.

Astute planning and development and management of open unused property.

Seminars and conferences to disseminate basic ecological knowledge which relates to the impact of various technologies on environmental quality.

Interagency cooperation with other sectors of the population in the development and conversion of source materials to viable curriculum. . . .

MASTER PLAN FOR ENVIRONMENTAL EDUCATION (Excerpts)

The New Jersey State Council for Environmental Education, funded through the Elementary and Secondary Education Act of 1965, is administered by the Newark, New Jersey, Board of Education. Established in September, 1967, the Council was formed to achieve the following six objectives:

1. Develop an evaluation instrument for Environmental Education Programs.
2. Inventory all Environmental and Outdoor Education programs and sites in New Jersey.
3. Assess existing Title III projects in Environmental and Outdoor Education.
4. Determine whether inner city youth are being served.
5. Increase public awareness of the value of Environmental Education.
6. Develop a Master Plan for Environmental Education in New Jersey. . . .

The primary objective of the master plan is to create, in the most rapid and efficient way possible, an environmentally literate citizenry—a citizenry who understand their interdependence with and responsibility for the total environment, and which posesses the knowledge and concern to solve existing problems and to prevent future ones. In the process, the master plan seeks to foster the greater use of the numerous learning environments which exist outside every textbook cover and schoolroom wall, and thereby to offer each citizen the deep satisfaction which comes from really sensing and understanding the daily flow of life around him.

. . .

We propose: (1) establishment of a Department of Education Technical Advisory Committee on Environmental Education; (2) encouragement of local school district Concerned Citizens Committees on Environmental Education; (3) strengthening the network of Environmental Education Centers; and (4) support for the proposed legislation included in this master plan. . . .

DEPARTMENT OF EDUCATION TECHNICAL ADVISORY COMMITTEE ON ENVIRONMENTAL EDUCATION (EXCERPTS)

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A Technical Advisory Committee on Environmental Education should be established with its primary mission to advise the Commissioner of Education on the implementation of a state-wide environmental education program of action.

It would serve the Commissioner of Education by gathering vital information, reviewing Education Department efforts related to environmental education, and recommending a course of action based on the master plan and other data resulting from its deliberations.

This Committee should consist of twenty members. They will be appointed by the Commissioner of Education for three year terms.

Ten members would be appointed from such groups as:

- State Department of Education
- State Department of Higher Education
- State Department of Conservation and Economic Development
- State Department of Health
- State Department of Transportation
- State Department of Agriculture
- Rutgers—The State University
- Other New Jersey Colleges and Universities
- County Superintendents of Schools
- School Superintendents Association
- Secondary School Principals Association
- Elementary School Principals Association
- Classroom Teachers Association
- Private and Parochial Schools
- Association for Supervision and Curriculum Development
- Title III Environmental Education Projects

The other ten members would be drawn from the following sources:

- Parents
- College Students
- Secondary Students
- Board of Chosen Freeholders
- Federated Boards of Education
- Municipal Conservation Commissions
- League of Municipal Governments
- County Park Commissions
- Citizen Service Organizations
- Private Foundations
- Business
- Churches
- News Media
- Labor and Industry
- Soil Conservation Districts

The Technical Advisory Committee on Environmental Education should address itself to the following:

a. Review, with the Commissioner of Education, personnel in existing educational agencies on both the statewide and local levels and recommend effective means for their overall coordination.

b. Recommend more effective means for utilizing the personnel resources available within the educational community. (Soil conservation service, Agriculture Extension Agents, etc.)

c. Identify those personnel in the educational community who are responsible for major curriculum changes at the state and local levels.

d. Devise a means for effectively coordinating the capabilities of education agencies with those of business, civic groups and federal agencies based in the state.

e. Identify the amount and allocation of those financial resources of the state and federal government now allocated to existing environmental education centers; consider the need for new or improved fiscal arrangements.

f. Consider the establishment of additional regional environmental education centers and environmental education research and curriculum development centers throughout the state and devise appropriate legislation for their establishment and continuation.

g. Identify and assess the capabilities of other environmental resources and agencies within the state and recommend means for their coordinated utilization. For example, county park systems, municipal conservation commissions, representatives of local and county natural resource agencies.

h. Keep abreast of new sources of Federal-State financial assistance programs.

i. Review existing education programs at all levels to determine their present effectiveness and future potential for creating an environmentally literate citizenry; recommend a system to insure the constant flow of new materials into the school curricula.

j. Assess new and changing educational technologies for their potential use in environmental education programs.

k. Consider the establishment of a permanent Education Department Environmental Education Division to carry out the recommendations of the Technical Advisory Committee and the Commissioner of Education.

l. Devise a managerial plan and organizational structure for actuating a comprehensive state-wide environmental education program for all educational institutions; determine a feasible timetable for this effort.

The Technical Advisory Committee on Environmental Education should prepare reports on its findings to be submitted to the Commissioner of Education at regular intervals (monthly or bimonthly). . . .

ELEMENTARY AND SECONDARY EDUCATION

Discussion

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It has been ascertained through a statewide survey, that approximately 200 of the existing 596 school districts are involved in some type of Environmental Education program. The scope and extent of these programs vary considerably among the school districts. Some programs are of an isolated type, a one-exposure approach, and usually are terminal. Others are of longer duration and incorporate many grade levels which use schoolsites, parks, local fields and woodlands, solid and liquid waste disposal plants, town meetings, newspaper stories, and many other community resources in their environmental education studies. If school students, the future voting citizens, are to become involved as effective monitors and change agents of their environment, then the schools must provide more than a peripheral acquaintance with environmental prolems. The school curriculum must be modified.

Recommendations

1. The primary concern should be to make the school personnel more aware of the seriousness of current and future environmental problems and of education's role in the restoration of environmental quality. This task would be accomplished through a combination of workshops, conferences and film/slide presentations involving teachers, supervisors, administrators, and others.

2. An important aspect of a modified curriculum would be the application of student learnings from environmental education experiences to the solution of real environmental problems. Through field experiences with problem areas in the community or region, students could be involved with the source of the problem, its consequences and its possible solution. For example, a new type of homework could be assigned in which youth would involve parents and other adults in collecting data related to a local environmental problem leading to suggestions for its solution. Young people, working with Municipal Conservation Commissions and local Planning and Health Boards could have first hand experiences not available through the usual school curriculum. Students could measure pollution of air and water, predict the life expectancy of existing solid waste disposal areas, conduct land-use surveys, study the history and design of zoning, health and conservation ordinances, evaluate present and predict future water-resource needs, and engage in many other real-life educational ventures.

The degree of direct involvement with a problem will be determined by the level of the school group in terms of academic achievement, grade, and reasonable proximity to the problem area. Field trips should include visits to industrial complexes, sewage treatment plants, polluted streams and lakes, farmlands where insecticides are either used or not used, as well as the traditional residence experiences at out-door centers. Use should be made of the Environmental Study Areas newly established under the direction of the Secretary of the Interior, Walter Hickel, by the National Park Service. Urban districts should utilize the "vest pocket" parks and other surrounding small open space areas available in their communities.

3. An improved means of transmitting to schools information available in many state agencies, about environmental problems, should be developed. Many studies, reports, maps, plans and other data developed by various state agencies could become important, integral parts of the school curriculum if a method of continuous communication could be developed.

ADULT EDUCATION COURSES

Discussion

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It is particularly important that the adult sector which controls the life of the community be reached. Environmental quality is a social problem which adults must be given the opportunity to learn more about if they are to exert effective leadership. Although the mass media have the ability to bring problems to the attention of the public, they cannot be expected to provide fundamental knowledge of environmental principles and processes which citizens must apply in their problem solving efforts. There is, therefore, a need at the community level for an adult oriented survey course on the environment—a course which begins with general principles and which progresses, through the use of local examples, to a consideration of the specific environmental issues of nation, state, and community.

Recommendations

1. At a minimum, one survey course on the problems of the environment should be part of every adult education program. In the design and conduct of the course, use should be made of members of the community who, either by vocation or avocation, are involved in environmental affairs, for example: members of the municipal planning boards, and conservation commissions; representatives of local businesses and citizen action groups; resource specialists of federal and state government. Such personnel might be employed effectively as teachers or guest lecturers for the course.

2. If response to the survey course is favorable, it is recommended that additional courses of a more detailed and specific nature, such as community planning, pollution abatement, and general ecology, be designed and offered, either through the adult education program or through the extension and community service divisions of neighboring institutions of higher learning.

3. Adult Education administrators and staff should examine all course offerings in the adult education program and suggest that the use of environmental issues be incorporated as appropriate.

EDUCATION OF THE GENERAL PUBLIC

Discussion

Our society is dependent upon the mass media for much of its information, and the media represent one of the most effective and economical means of bringing environmental issues to the attention of the vast body politic. Continuous and reliable coverage of such issues is an important component of any overall plan to increase the public's awareness, knowledge, and willingness to act in the interest of environmental quality.

There are, of course, other productive methods of reaching the general public. Local sponsorship of public forums, edu-

cational displays, and similar special events are a proven way of fostering public interest and support. Another example is the film, "Later, perhaps," produced by the New Jersey State Council for Environmental Education. Highlighting the State's pressing environmental problems, the film reveals that at least some schools, through curriculum revision and the use of innovative teaching methods, are engaged in an effort to teach their students about man's dependence upon and responsibility for the environment. The film finally suggests that the audience examine the programs of their own school systems for environmental content.

The means are immaterial, but the general public must be made knowledgeable if it is to understand and support the efforts of government and industry to restore environmental quality.

Recommendations

1. The Technical Advisory Committee on Environmental Education should consider the development of a comprehensive state-level public education program, to keep the public continually informed of the environmental problems of state and community, and to foster increased citizen participation in the solution of such problems. This dissemination effort could include such vehicles as forums, lectures, magazines, newspapers, films, radio and television programs. The New Jersey Public Broadcasting Authority, launched in January, 1970, might be particularly valuable in this respect.

2. The Commissioner of Education and the Technical Advisory Committee should encourage the development of local public education programs. There is an infinite number of ways a local public education program could be conducted and it is worthwhile to mention a few.

Local newspapers should be urged to cover environmental issues and possibly even carry a weekly or bi-weekly column devoted to the environment.

Educational displays should be constructed and placed in local business establishments and public buildings.

Evening forums on local issues should be organized and speakers recruited from the ranks of local and county government, business, county and local based governmental resource agencies, schools and colleges, civic and other groups.

Walking and driving tours of the local region should be developed to acquaint citizens with the environmental challenges and opportunities extant within their home communities. These tours, conducted on a bi-weekly or monthly basis, would identify specific environmental problems as well as follow through on their elimination.

3. Hopefully, these facets of a public education program would lead to corrective action on two fronts: to urge the general public to maintain awareness of environmental issues and the course of their alleviation; and to spur the contributors to local pollution and other forms of environmental detrioration, not the least of whom is the general public itself, to initiate and maintain measures eradicating the environmental problems lest further despoilation occurs.

LOCAL CONCERNED CITIZENS COMMITTEE

Discussion

As citizens become alerted to and concerned about the problems associated with the environmental crisis, they will demand greater participation in the decision-making process effecting solutions to these problems.

These citizens will also want to know what is being taught in the schools relative to environmental problems. They will naturally want young people to move into adulthood with a thorough understanding of the causes and consequences of the current problems, and their solutions. Inevitably, these citizens will want to insure that the school curriculum is relevant to the world that young people face, and will face.

Municipal Conservation Commissions, recommended by legislation enacted in 1968, are being formed throughout the state. Kindred groups, such as Survival, Inc., Friends of the Earth, and other environmentally related organizations, have directed attention toward environmental education programs in the schools.

Recommendation

The Commissioner of Education should urge each school district to create a Concerned Citizens Committee on Environmental Education. This committee would serve as liaison between environmentally related organizations, such as those mentioned above, as well as local established governmental agencies, and the local schools. This committee would also assist the school district in the study of local problems and in the development of pertinent curriculum materials. It would report regularly to the Superintendent of Schools, Board of Education, or a designated administrative staff member. Local businessmen, representatives of labor, government, industry, medicine, the clergy, conservation commission, school personnel, and others who are in a position to contribute services and advice for those planning programs in environmental education should be invited to serve on the Concerned Citizens Committee.

HIGHER EDUCATION

Discussion

College and university students have become increasingly concerned about the environment. The national teach-in (scheduled for April 22, 1970) will mark the beginning of a period of intense examination of environmental quality by the student body. There is little evidence, however, to show that our institutions of higher education are responding to the challenge of the environment in any planned manner, either the undergraduate or graduate level.

In 1968 the New Jersey State Council for Environmental Education appointed an ad hoc committee to review this situation in the colleges and universities of the state. Generally, it found that environmental understandings and issues are not being incorporated into general education and specialized curricula. When environmental quality was discussed, it was usually restricted to a few specialized and technical courses. An inter-disciplinary treatment of the subject was found to be a rarity. While the ad hoc committee recognized the need for highly specialized courses of study, it stated that there was a compelling need for a pre-professional and liberal arts program that would inform students of one of society's most pressing problems.

At Glassboro, Trenton and Montclair State Colleges, graduate programs have been established to prepare teachers as environmental education specialists. The initial programs were made possible by the Education Professions Development Act, which provided stipend support for experienced and prospective teachers and institutional assistance for each of the three colleges. This cooperative program has produced approximately forty graduates who have a master's degree in Conservation and Outdoor Education. Presently, seventy students are enrolled in similar, but non-federally supported programs.

For nearly twelve years, teacher education students at the state colleges have spent five days in residence at the New Jersey State School of Conservation in Branchville. Attendance at the school was made a graduation requirement in

1957 by action of the State Board of Education. When the Board of Higher Education assumed control of the state colleges, this requirement was made optional. Presently, only students from Glassboro and Trenton State Colleges participate in the program. In addition, during their junior year practicum experience, Glassboro students are given an opportunity to work with and observe youngsters at the Conservation and Environmental Science Center at Brown's Mills. Several State Colleges and Rutgers (the State University) have offered in-service conservation and environmental education courses and workshops at various locations throughout the state. These courses are designed to acquaint teachers with environmental problems and to assist in curriculum development.

Recommendations

1. The colleges, community colleges, junior colleges, and universities of the state should re-examine their existing statements of educational objectives to insure that the concept of harmony between man and environment is in some way expressed as an essential goal.

2. Each institution of higher learning should establish a faculty-student committee on environmental education. The purpose of the committee will be to explore and recommend desirable modifications of present course offerings and to develop new courses at the introductory and intermediate levels. The establishment of interdisciplinary courses on the environment should be especially encouraged.

The faculty-student committees should promote and facilitate independent study programs and similar course structures in which students would be able to work with local planning boards, health boards, conservation commissions, and similar entities. Such courses would not only be of tremendous assistance to local communities but would furnish students with invaluable experience and perspective.

3. Offerings at community and junior colleges should be expanded to include environmental education courses as a general or liberal education requirement, and also as terminal vocational training programs to prepare students as technicians to work in the emerging field of environmental quality. . . .

Appendix E
A REPORT TO THE CALIFORNIA STATE BOARD OF EDUCATION BY THE CONSERVATION EDUCATION ADVISORY COMMITTEE
(Excerpts)

STATE OF CALIFORNIA,
DEPARTMENT OF EDUCATION,
Sacramento, Calif., August 6, 1969

CALIFORNIA STATE BOARD OF EDUCATION,
Sacramento, Calif.

DEAR BOARD MEMBERS: Throughout our State and nation there is a growing public awareness of the serious environmental and resource use problems facing mankind today. The informed citizen expects his educational institutions to equip youth with the knowledge and attitudes necessary to develop solutions to these problems.

A modern philosophy of conservation is founded upon environmental unity. The problems of uncontrolled growth and development are problems of both the city and countryside. The productivity of our forests and farms can no longer be separated from the productivity and liveability of our cities—the downgrading of part of the environment inevitably affects the total upon which all life on the planet depends. Conservation requires the rational use of the physical environment to promote the highest quality of living for this and future generations. Conservation education must be dedicated to achieving an environmental quality in which the individual can make the highest and wisest use of his talents and potentialities.

An informed public working for the common environmental good through its democratic institutions at all educational, private interest and professional levels can break the chain of destructive land use, restore the land which has been abused and build balance and beauty into our cities of the future.

An educational program designed to build such attitudes of stewardship toward maintaining the quality of our common environment enabling citizens to use wisely, not destroy, the resources at their disposal may be defined as conservation education. The Conservation Education Advisory Committee to the State Board of Education was established to determine the status of conservation education in California and to make such recommendations as they consider appropriate. The following report details the work of the Committee and contains recommendations for the consideration of the California State Board of Education.

In your charge to the Committee, which is found in the Appendix, you requested that these specific areas be studied in detail:

1. Teacher training at both the undergraduate and in-service levels.
2. Cooperation with governmental, industrial and private organizations to provide worthwhile printed materials, films, field trips and other resources for teacher and student use.
3. The conservation content of State adopted textbooks
4. The role of the State Department of Education and Resources Agency in Conservation Education.
5. Recommended school conservation education programs in grades one through twelve.

Since the fall of 1967, the Committee has been holding regular monthly meetings. Early sessions were devoted to gathering materials and reviewing the current status of conservation education in California. During the past six months the Committee has been diligently putting their thoughts and findings into writings in the hope that the recommendations we make will be of value to you in your service to the children and citizens of California.

Membership of the Committee has changed during the period of our deliberations. Of the original membership, only Dr. Samuel Wood was able to serve for the entire time. The present Committee wishes to express its appreciation to these former members who made a contribution to the final report now before you:

David Hurford
Paul McCloskey
Casper Weinberger
Rodney Heft

The Committee as it now stands represents a wide spectrum of conservation interests and has, over the past months, developed into a coordinated, working team well suited to its task.

Two pieces of legislation enacted after the Committee was activated greatly increased the importance of our project. Senate Bill 1, signed into law in 1968, requires that adopted courses of study shall provide for instruction in "protection and conservation of resources" and "man's relationships to his human and natural environment" in appropriate grade levels and subject areas, grades one through twelve (*Education Code* Section 8503,8551-c, 8571-b). Senate Bill 206, also passed in the 1968 session, established in the Department of Education a Conservation Education Service to encourage and assist school districts in developing and maintaining conservation education programs. The bill also authorized the Superintendent of Public Instruction, upon the recommendation of the Conservation Education Service, to make planning grants to local districts to help them develop conservation education programs suited to local needs (*Education Code* 363.5, 6011.5). Unfortunately, no funds were provided for the services authorized by Senate Bill 206. Senate Bill 1392 was introduced by Senator Moscone in the 1969 legislative session to appropriate $125,000 for this purpose, but the bill died in the Senate Finance Committee.

The resources of education, public agencies, and private conservation organizations must be unified and directed toward improving conservation education programs offered to pupils in the schools of California. Both financial and human resources in generous quantities will be needed if we are to help children develop an attitude of stewardship toward their environment and its resources.

Considering the alternatives—the loss of natural beauty, depletion of resources, and even the loss of the ability of the environment to support life—a major effort is clearly in order. The problem is great and the time is short. Let us act now while there is yet time. The Committee respectfully recommends that members of the State Board of Education care-

fully study the following report and take action to implement the recommendations it contains.

Sincerely,

JACK DAVIDSON, *Chairman,*
Advisory Committee on Conservation Education.

. . .

SECTION II.—BASIC PHILOSOPHY AND DEFINITION OF TERMS

. . .

CONSERVATION EDUCATION

We define conservation education as the means of achieving an educational philosophy that will help each student develop a healthy attitude of personal responsibility toward his environment and its resources, and to provide him with the concepts, the knowledge and skills needed to contribute validly to the decision-making process on issues involving the environment and its resources. In all grade levels, environmental facts should be taught as they relate to each other, not as isolated bits of information. Children should become aware of the interrelated nature of living processes. Conservation is not an isolated subject and, therefore, cannot be dealt with in a vacuum. It deals with the scientific and long-term management of biological systems for human benefit. Conservation education requires understanding of all environmental and socio-economic systems and their relationships. Forest management and related land use, for example, can then be placed on a sound and enduring basis so that man can both use and retain his rich heritage of natural resources.

The Committee recognizes that the enlightened conservation conscience we are seeking to develop cannot be created by a single course offering, but must be developed progressively throughout the entire school experience. State law now requires conservation instruction in grades one through twelve. We would further suggest that an understanding of the interrelationships of nature be included in pre-school and headstart programs whenever possible. It is also important that conservation instruction be carried on in vocational training schools and colleges. Although the major subject areas in which conservation concepts would be stressed would be the natural and social sciences, the possibilties for integration into other subject areas should be fully exploited.

This discussion of conservation education presupposes an informed teacher. The committee recognizes one of the greatest problems in the field of conservation education today is the teacher who has little or no knowledge of the field. Therefore, we consider preservice and inservice training to be the cornerstone of any effort to upgrade conservation education.

The recommendations made here look forward to an electorate that will dedicate its efforts to healing the scarred land, protecting our great natural beauty, enhancing and preserving the amenity of neighborhoods and building balance and beauty into the cities of the future.

Massive educational programs for teachers and students, equal in weight to the present and projected assault on our resources and the quality of our environment, is the purpose of this report. There is little time remaining to solve these problems. This committee sees no miracle panacea nor technological breakthrough on the horizon. An informed public working for the common environmental good through its democratic institutions, while there is yet time, can be the only answer. Our society, our governmental structure, our environment, our community values and ambitions are only as good as we, the members of that society, choose to make them.

SECTION III.—THE SCHOOL PROGRAM

GENERAL CONSIDERATIONS

The basic goal of any conservation education program should be the development in students of an understanding of their environment and a feeling of personal responsibility for maintaining its quality. Unfortunately people often speak of conservation as something others should be doing, when really it is something everyone must practice if we are to continue living on earth with any degree of health and comfort.

One of the shortcomings of past conservation education programs was that the emphasis was placed on resources and problems far removed from the student. The farmer caring for his soil, the forester carefully managing the forest were, and still are, important concepts to which children must be exposed, but what of the student's immediate environment and his personal relationship to it?

For more than 90 percent of all Californians, "immediate environment" means an urban area. Thus, to be truly relevant to the majority of our citizens, a study of conservation must include consideration of urban as well as rural ecology. As children develop, their interests and awarenesses grow from the immediate environment of the bassinet to the home, the community, the State, the Nation, the world, and finally the universe. A child's conservation conscience should likewise develop as a part of this ever-expanding sphere of interest and knowledge. He should be shown each step of the way how he personally relates to his own environment so that he might learn to put his own ecological house in order before going forth to save the universe.

Another shortcoming of past conservation education programs was the all too common practice of studying resources as if they existed separately. For example, soil, water, animals, and plants, were studied as if each existed in a vacuum. Seldom did earlier conservation studies deal with the interrelationships of resources or with the interdependencies between man and the resources. If children are to develop adequate conservation consciences, their knowledge about the world must include awareness and understanding of ecological relationships and the effect of human activities upon these relationships.

The Committee recognizes that conservation is basically a social concept. Decisions regarding man's use of the environment must be based on economic feasibility, social acceptability and political reality. The findings of the so-called pure sciences provide needed information and knowledge about the world, but decisions concerning actions to protect, utilize, and preserve the environment and its resources are a function of society and must be studied in the social sciences and humanities curriculum. Because of the possibility of controversy in dealing with social and political matters, extreme care should be used in developing conservation education programs to avoid the danger of making the classroom a "soap box" for any point of view.

In general, then, school programs must provide conservation experiences in many subject areas throughout the entire school curriculum and in every grade level. We would hope that each graduating student will have a thorough grounding in basic ecology, resource technology and the social sciences as they relate to resource and environmental problems upon which to base a personal conservation ethic. These experiences must deal with the environment in an integrated way and must be as relevant to modern urban dwellers as to rural students. Varied programs to meet the needs of a varied population must be designed. Of particular significance in a good conservation education program is the utilization of

the environment outside the classroom. Such experience need not always be of an extended "field or study trip" nature to be of value. Neighborhood nature study walks and short trips to study a local conservation problem such as a polluted stream, a badly eroded hillside, a smoking factory, or an area of urban blight can be most effective. Good examples of wise-use resource development and management should also be sought out and studied.

An extended outdoor study experience can also be a very effective part of a total conservation education program, particularly when it is closely related to the ongoing classroom activities. Such an outdoor program, among other benefits, provides children with an ecological baseline or point of reference which they will find necessary in evaluating the various environments which man has modified. Resident outdoor schools and other field study experiences should ideally include study of mountain, seashore, desert, agricultural, and urban environments. Existing programs of this type should be expanded and new ones encouraged with financial assistance from the state. A natural study area on a local school site can be a most effective conservation teaching device. A number of school districts are establishing such areas, and it is hoped that this trend will continue. Ideally such areas should be included in the master architectural and landscaping plan of a school.

Finally, an effort must be made to enable children to practice conservation throughout the entire educational process. The most elaborate and expensive program imaginable is valueless unless it creates the desired behavior patterns in children. Some suggestions to build such behavior patterns are:

Encourage children not to waste food, supplies or other materials.

Encourage children to help keep their immediate environment (school, home, neighborhood) clean, neat and attractive.

Help students to discover if they might be a source of environmental pollution. If so, discuss remedies.

Encourage student organizations to participate in local environmental improvement or conservation programs.

Encourage students to contact industry, government agencies, and private conservation organizations for information on specific conservation problems.

Encourage high school or junior college science students to act as guides for nature study field trips for elementary students.

DEVELOPMENT OF THE LOCAL PROGRAM

A good school program in conservation must be integrated in all appropriate subject areas in the curriculum at all grade levels. The sciences can provide factual knowledge to help the pupil understand the complexities of the natural world, while the social sciences can provide the means to understand the political, social, and economic aspects of conservation. A study of the social sciences also helps the pupil understand the democratic processes through which individuals can work together to preserve and enhance their environment. An excellent curriculum must integrate the ideas and concepts from the various subject areas in such a way as to help each pupil fully understand and appreciate man's interrelationships and dependence on the material world. Other curricular areas such as practical arts, mathematics and language arts offer conservation teaching possibilties. In particular, the humanities should be utilized to sharpen the child's natural awareness for beauty so that he may seek to preserve and perhaps create beauty in the natural and urban environments.

In addition to the inclusion of conservation concepts throughout the regular school program, a special course at the secondary level to tie all of the various concepts together should be required for all students.

Concepts and knowledge from a great variety of subject areas should be utilized in developing conservation education units, guides, and other teaching material. The State Department of Education, colleges and universities, county and district personnel should provide the expertise required to develop such materials. A good program should include instruction about the basic principles and techniques of resource management and environmental control which will enable people to initiate and support wise environmental management activities. A close working relationship between educators and persons in positions of responsibility in resource utilization and management is essential in devising educational programs to secure these understandings.

CONSERVATION EDUCATION FRAMEWORK

A good conservation education program should be based on a conceptual framework or set of guidelines. With the increasing wealth of knowledge available today, imparting only information to students is both impractical and impossible. Effective instructional programs in any field must deal with major ideas, principles and concepts. This is particularly true in the field of conservation. Concepts provide scope and sequence, while facts and information can be chosen to suit local situations. Instructional materials can pinpoint opportunities for teaching conservation at various grade levels and in various subject areas.

A state-recommended framework or set of guidelines should be developed by professional educators based on the concepts listed in the *Handbook on California's Natural Resources.* The Advisory Committee on Conservation Education should be retained to advise these professional educators and review the work as it progresses.

MATERIALS AND FACILITIES

The State Department of Education through the Conservation Education Service should provide leadership in developing conservation materials which are factual, current, easy to use, and adaptable to local situations. The materials would include films, books, pamphlets, pictures, charts, posters, curriculum kits and modules. The Department should also investigate and disseminate information about new techno logical teaching devices suitable for use in this field. Special efforts are needed to improve conservation education programs at the junior and senior high school levels. Frequently opportunities for instruction in various course areas such as science, economics, and political science are overlooked. As a result, few students graduate with an awareness of their relationship to the total environment or of their responsibilities for its care. Hopefully, as conservation instruction is improved and upgraded at the elementary school level, there will be a corresponding improvement at the secondary level.

All school districts should be assisted as needed in the establishment of planned, permanent outdoor study areas (a) on school grounds, (b) elsewhere in the district or community where and when opportunity exists. The community center type of school construction should be studied and used wherever possible. Under this concept, several local agencies cooperate in the planning and construction of a multipurpose community facility which includes a city park, library, school, city offices and other facilities. Such an arrangement permits better utilization of the building and grounds than possible when each agency builds separate installations. A nature study

area which could serve both schools and the community could be included in such a community center. The use of local, state, and national parks and environmental study areas should also be encouraged.

FUNDING

Funding is one of the most critical problems facing school districts in developing and implementing sound conservation education programs. Many of the best features of good programs, such as outdoor laboratories, field study trips, and resident outdoor schools, are difficult to finance under present school fiscal conditions. Funds are also necessary for inservice training programs.

Most districts find that the State contribution plus revenue raised from record high property taxes are often not enough to provide even an adequate program. It is beyond the scope of this Committee to recommend remedies for this situation, but it is agreed that all programs—including conservation—suffer from this condition.

Funds for building resident outdoor education schools authorized by Section 7951 of the State *Education Code*, might be supplied through the issuance of State revenue bonds. The bonds could be retired through funds collected from school districts for participation in outdoor education programs. Such schools could be located on public lands and be operated within the rules and regulations of the public agency concerned. It is estimated that approximately twenty years would be required to pay for such a school facility.

Local districts should be permitted to obtain additional local funds to establish and operate outdoor schools if the community so desires. Legislation enabling school boards to levy an outdoor school tax override or to submit such a proposition to the voters should be passed by the legislature.

PERSONNEL

The cooperation and active support of school administrators is essential in developing successful conservation education programs. It is important that they be included in any plans for implementing conservation education in local school districts. Their enthusiasm and support as educational leaders is essential to the success of any plans or programs. They must have the skill and knowledge to guide and support local endeavors, and must accept responsibility for providing leadership in this important curricular area.

The key person in any conservation education program is the classroom teacher. In order to help them meet their responsibilities we must:

Convince them that they are indeed the key to a successful program.

Equip them with the skills and knowledge they will need to do the job.

Provide them with the materials, equipment, and facilities they must have.

SECTION IV.—TRAINING OF TEACHERS IN CONSERVATION

PRESERVICE EDUCATION

The training of teachers is basic to any effort to upgrade conservation education. The goal in training the teacher in conservation should be the development of a well educated, sensitive, articulate person who can present all sides of conservation issues in their proper ecological and social context for, in the broadest sense, all knowledge is related to conservation. This implies that a general education rather than a specialized undergraduate program is desirable. It is also recommended that other courses in the preservice curriculum include the conservation concept where appropriate.

At least one upper division conservation course designed to tie together and summarize conservation concepts gained in earlier courses should be required for all teacher trainees. The course should include a description of the resource base available to mankind, the manner of its rational use, the alterations which occur as it is used, the limits of acceptability of these changes, the economics of resource management and the formulation of public policy. The study of the conflicts between uses and the resolution of these conflicts should form a major segment of the course. These topics should be treated in a general rather than a highly technical manner. A portion of the course content should be devoted to instruction in the techniques of teaching conservation, the preparation of curricula in this field, and a knowledge of available materials and resources. . . . Due to the wide acceptance of the elementary outdoor school program each elementary teacher trainee should be required to spend one week working in a resident outdoor school as a part of his practice teaching assignment.

In order to provide a thorough grounding in the principles of conservation, it will be necessary to utilize the expertise of several fields in developing such a course. For example a knowledge of the resource base involves a knowledge of geology, soil, water, air, vegetation, and wildlife. The techniques for the utilization of this base include the areas of agriculture, mineral technology, forestry and various related industrial processes. The aesthetic and amenity values of the resource base and the economic, political, legal mechanisms through which people respond to their environment and its resources involve the social sciences and the humanities. Specialists in the education field will be needed to provide instruction in specific methods of teaching conservation.

INSERVICE EDUCATION

The Committee recommends that a massive inservice educational program be established to enable teachers to meet their obligations in the field of conservation education. These classes should cover the subject matter of conservation described above. Some of this material could be covered in field courses; either in traveling classes or at camp locations. It is important to use the natural environment whenever possible. The use of well-produced films, television tapes, and other materials would also be of great value in such an effort and should be produced at the state level.

The teachers most in need of conservation education instuction are those who have little or no interest or knowledge of the subject. A real effort should be made to reach these people. All too often the only people who take conservation education courses are those who already know quite a bit about the subject and are doing at least an adequate job of teaching it.

Other points to be considered in planning an inservice class are:

The program should be geared to the curriculum the participants will be using.

The time and location must be convenient to participants.

All materials and facilities should be on hand for all class sessions.

Incentives in the form of salary point credits, release time or pay should be provided. The Department of Education Conservation Education Service, county offices, governmental agencies, industry and private conservative agencies should provide leadership support and assistance for these programs.

OTHER CONSIDERATIONS

The need for college level instruction in conservation for students in all disciplines is necessary. These people will, as a group and individually, exert great influence on society throughout their careers and therefore must be aware of the need for conservation.

The Committee strongly urges colleges and universities to continue and intensify research in the field of environmental problems.

Junior colleges throughout California have a vital role to play in conservation in providing general survey courses for a great number of students and in training resource technicians. It is recommended that these two obligations be reviewed regularly and that improvements be made when and where indicated.

The Committee recommends that the short intersession courses offered on many state college campuses be used for teacher inservice training in conservation.

The Committee recommends that industry, governmental agencies and private conservation groups assist in summer conservation education workshops for teachers.

The Committee recommends that colleges and universities offer environmental education for the public in general and for school teachers in particular through evening courses, seminars, lectures, summer courses and workshops, extension courses, and correspondence courses. These can provide an effective means of reaching many people, particularly adults, for whom regular classroom instruction during the academic years is not available.

The language of SB 1 implies that there are many conservation teaching possibilities in a great many subject areas throughout the elementary and secondary school curriculum which should be utilized. The committee wishes to be sure that this point is not lost on institutions of higher education. In a survey prepared for this committee, it was determined that at least 26 areas of study offered in colleges and universities certified for teacher training in California offered courses which could be of value in providing a teacher trainee with background material in conservation. These subject areas included economics, political science, life sciences, business administration, forestry and even philosophy. Clearly concepts of conservation can and should be included in the content of many college level courses offered to prospective teachers. Nor should such instruction be limited to teacher trainees. All of society can benefit from an emphasis of this nature, as graduates so instructed assume positions of leadership in the community.

SECTION V.—THE ROLE OF THE COMMUNITY IN CONSERVATION EDUCATION

A. PRIVATE CONSERVATION ASSOCIATION

Reflecting a growing public awareness of environmental problems, a variety of private organizations are involved in the current conservation effort. They can make a major contribution to conservation education.

These organizations can be divided roughly into (1) membership groups; (2) community groups; (3) youth groups. Each group has a special emphasis and stresses a particular point of view. Each of these groups publishes material of one kind or another which reflects their particular interest. Some have money to distribute their material and are in the business of doing so, but most have meager funds, publish primarily for their own membership and are hard put to supply their material upon request or even for payment. Nonetheless, there is a great wealth of conservation education material here to be utilized.

Most of this material is suitable primarily for teacher and upper-grade use. However, some groups—notably the Audubon Society—produce broad spectrum material aimed at specific grade levels as well as for adult use. It appears that there is room for development of more materials and programs on the primary levels by most conservation organizations.

Along with these organizations there are a number of individuals and groups in professions related to conservation who are interested in the educational aspect. Included are architects, landscape architects, biologists, scientists of many disciplines, artists and naturalists. Several dedicated volunteers are doing outstanding conservation work with their local school districts. There is a good deal of interest in this kind of volunteer effort among other individuals throughout the state and devoted volunteers can make a major contribution.

Youth groups, including church groups, frequently include conservation activities among their programs. Outings, tree-planting programs, and clean-up trips, often involve local school children. There is an opportunity here for these groups and the schools to work together—to the benefit of all concerned.

Other community conservation educational facilities include junior museums, nature museums, and arboretums, which are supported by interested citizens. Some schools take maximum advantage of these facilities holding classes in the museum, using available equipment and displays. Others are overlooking this kind of opportunity.

To sum up briefly, there is a wealth of material—valid and important material—being produced by private conservation organizations. There are also many interested youth and community groups and individuals who can contribute time and know-how to conservation education. The question is how best to utilize the material and talent available.

Proposed materials center

A central library and repository of conservation education materials from private conservation groups, from industry, from professional, scientific and governmental sources should be established at the state level. This would fill a great need by gathering together all the available "extra-curricular" conservation material. Such a repository would also serve as the master source for regional conservation education centers. In setting up such a library, new methods of data processing, new library procedures, and new ways to distribute material should all be explored and utilized with imagination. The material included should be national as well as local. It should be comprehensive, including audio and visual as well as graphic. It should be screened, evaluated for validity, pertinence, objectivity and usefulness. Sources should, of course, be identified. The best use of the material should be analyzed and described and should be reviewed periodically.

Broad subjects such as "water" could include everything from Save-the-Bay pamphlets to a P.G. & E. brochure on rivers, from the Soil Conservation Society booklets to the National Wildlife Federation publications. Local water problems could then be studied in a broader context.

Such a library could also serve as a conservation education activities bureau—publishing a schedule of available speakers, films, field trips, meetings and conferences, at regular intervals.

A strong effort should be made to interest a major national foundation in funding this library. . . .

B. ROLE OF BUSINESS AND INDUSTRY IN CONSERVATION EDUCATION

The widening public awareness of conservation and en-

vironmental issues and the general acceptance of the so-called spaceship earth theory, have effectively dramatized the choices to be made in the intelligent management and utilization of our resources, from air and water to farmland and forests.

A large number of companies, particularly those in resource-oriented industries, have shown definite and growing interest in all educational processes, from kindergarten through the graduate study level. Many have offered active assistance in both delegated manpower and materials.

In another portion of this report the point is made that a good conservation education course for teachers should include a study of the relationships of resources to economics and other social factors, as well as to the policies and conflicts in human relationships. These conflicts directly involve the use and management of resources.

Therefore, private resource-based enterprise must be involved in conservation education—which we agree includes environmental education, and which we agree must begin with the conservation of the individual and his culture—if it is to remain viable.

The environmental deterioration we are facing is caused by the demands of people. More people, demanding to go more places, to have more things, to enjoy more leisure in more different ways—have produced the richest, and most prosperous, but potentially the most catastrophic civilization in terms of environmental destruction the world has ever known.

We are at a critical balance now and the choices we must make grow increasingly important. The conservation education program of the future must be based on the question of choices—choices between that which we must have, that which we would like to have, and that which must sometimes, however reluctantly, be judged something we do not need at all. Private enterprise must furnish honest and comprehensive information regarding these choices if intelligent decisions are to be made.

Conservation education becomes, then, not a floating burden to be assigned to a junior executive with a little time on his hands, but an item of abiding interest to the major executive who must maintain balances now, and plan for operation as far into the future as reasonably foreseen.

Conservation education deals with the entire environment. The basis for sound judgments must be widened to include economic and use criteria, as well as the more obvious and currently popular facets of recreation and aesthetics.

The Department of Education should regard business and industry as willing allies and helpers in the conservation effort. The Conservation Education Service should, as a matter of course, establish and maintain communication in depth between itself and the industrial community through responsible organizations representing both California and national industry. As proposed in Section VII, the permanent Statewide Advisory Committee will have the industrial representation, essential for such communication.

Communication

The customary time lag between the development of new industrial processes and techniques as well as discoveries in materials or applications, and their eventual appearance in textbooks and classroom must be shortened drastically or eliminated.

The communication established between the Department of Education and business and industry through the conservation education consultant's office must be a two-way street so that educators may have at least a chance to indicate what they need and want from industry and industry a chance to put the requested information in usable form that will fit within the patterns of today's schools. Once this idea is established as a workable premise, a minimum amount of regulation should be imposed so that an informal and innovative approach to information dissemination may evolve.

Many teachers now in the classroom are often unaware of the variety of sources of information available to them, and all too frequently they overload the sources they do know about with repetitious or misdirected inquiries. Such practices result in a great waste of time and money. Conversely, industry frequently must fumble with a series of inquiries before it can analyze the situation and develop usable materials and services for educators.

The permanent Statewide Advisory Committee on conservation education as proposed in Section VII should be established without delay and should include as an early priority establishing guidelines which permit the classroom teacher to work more effectively with industry obtaining worthwhile information, materials and services. A similar broad and nonlimiting arrangement should be set up and kept current to give the business and industrial communities a basic insight into the needs of teachers.

C. THE ROLE OF RESOURCES-ORIENTED GOVERNMENT AGENCIES IN THE SUPPORT OF CONSERVATION EDUCATION

While the statutory authority to provide statewide leadership in conservation education lies with the Department of Education, the Resources Agency of California, along with federal resources-oriented agencies operating in California, should seek to provide technical support to educators, drawing upon the expertise of the people in these agencies. There exists an agreement of cooperation between the Resources Agency of California and the State Department of Education, signed first in 1963 and then reaffirmed by a new agreement on July 5, 1967 which clearly delineates these responsibilities. To extend the quality of such assistance and to coordinate activities with the various agencies of the United States government in California, there has been organized a State-Federal Resources Information and Education Officers Council which has been meeting since December, 1967. Membership on the council includes, from the State Resources Agency, representatives of the Departments of Conservation, Parks and Recreation, Fish and Game, Water Resources and the Water Resources Control Board; and the State Department of Agriculture.

From the federal agencies there are representatives of the following organizations: Army Corps of Engineers, Fish and Wildlife Service, Forest Service, Bureau of Land Management, Soil Conservation Service, National Park Service and the Bureau of Reclamation. In addition to the representatives of Federal and State resource agencies, a representative of the California Department of Education regularly attends the meetings and participates in the work of the group as an ex officio member of the council.

As the various agencies recognize the increasing importance of their role in conservation education, it is expected that the demand for services and materials will increase and therefore the agencies will have to increase their budgets for these functions.

Through interagency cooperation and with the direction and assistance of the Department of Education, duplications and materials and services can be eliminated and the net effort will be a much more efficient and effective program.

State and Federal agencies

Public agencies at the state and federal levels, particularly those managing large areas of public lands, such as the U.S. Forest Service, National Park Service, U.S. Bureau of Land

Management and the State Department of Parks and Recreation. State Division of Forestry and State Lands Commission should prepare informational material designed to inform educators and students of the value of public lands as educational resources for field trips, and outdoor education centers, and make land available for this purpose. For example, the California Department of Parks and Recreation and the Department of Education could jointly construct and operate resident outdoor schools at various locations in State parks throughout California. The Department of Education could be responsible for the educational staff and instructional program, while the Department of Parks and Recreation would supply information, interpretive services, and operate the physical plant facilties. A unit cost to cover operating expenses for the facilities and permit loan repayment would be set up, and school districts would be permitted to send students upon payment of the established weekly unit cost. Initial development funds for facilities could be provided by sale of revenue bonds.

Similar programs, similarly financed, could be developed with all federal and state agencies operating in California to make outdoor areas under their control readily available for outdoor education purposes.

Study kits emphasizing the methods and techniques of the historian could be developed by agencies managing historical facilities. For example, a kit containing facsimile documents, pictures, drawings and other materials could be prepared for Sutters Fort. Questions could be prepared which could be answered by careful study of the materials in the kit and a visit to the Fort. Conflicting or unrelated information could be introduced to provide students with an opportunity to make judgments based on a careful study of available information.

Field trip procedures and policies differ widely among the various school districts. The lack of uniform procedures in making reservations, and pupil preparation creates problems for resources management personnel offering field trips. It is proposed that the Conservation Education Service of the Department of Education develop a set of guidelines for pupil-teacher planning and conduct on field trips which could be printed and distributed by the Department of Education.

A simple guide suggesting pre-visit studies, on-site investigations, and follow up activities for teacher-use should be available for all field study areas used by students. It is suggested that the Conservation Education Service prepare an outline for the development of such a guide to assist management personnel in preparing material locally. One or two sample guides could be developed jointly to serve as examples.

Local resource management personnel should be helped to examine their educational activities to determine if they are making the most effective use of their personnel. It is suggested that teacher training and curriculum consultation, for example, is a better use of resource personnel time than conducting student tours when the students are inadequately prepared or supervised.

The California Department of Parks and Recreation is developing a mobile unit to help students gain a better understanding of California history. It is proposed that the Department of Education offer all possible assistance on this project.

Continuing liaison between the Department of Education and all federal and state land management agencies is necessary and should be maintained. Financing and staffing of public resource agencies and the Department of Education to meet the increased demands for educational assistance that can be expected as a result of the conservation requirements of the *Education Code* should be provided by the Legislature for state agencies. Federal agencies should receive budgetary support from the Congress for their activities in the educational field.

The Committee recommends that the California Resources Agency coordinate all of its activities in the conservation education field through the office of the Chief of Conservation Education. The person assigned to this position should work closely with the conservation education consultant in the Department of Education.

The Committee believes that the State-Federal Resources Education and Information Council should be augmented as needed and continue its work of coordinating the efforts of the various agencies, and that the Department of Education continue to cooperate with this group through its conservation education consultant.

SECTION VI.—CONSERVATION EDUCATION MATERIALS

The conservation instruction mandate contained in Senate Bill 1, has vastly increased the already critical need for high quality graded conservation education materials for all levels and all areas of the education system of California. The needs for quality curriculum materials are magnified by (1) inadequate teacher preparation and consequent low level of interest in conservation; (2) diversity and difficulty of locating sources of graded materials; (3) the time and dollar costs of gathering materials; (4) the competition of other requirements and interests; (5) the limited knowledge and interest in conservation of most leading authors in most fields; (6) the failure of some conservation-oriented authors to link their conservation interests with their major academic discipline; (7) the failure of the Curriculum Commission to include conservation in its specifications and to utilize conservationists in textbook evaluation: and (8) the approach of Senate Bill 1 which is based upon integration of conservation education with other disciplines rather than treating it as a discrete element in the curriculum. These considerations create a need for the inclusion of conservation concepts and content in most of the textbooks used in the State and pose at least as many and as serious problems for authors as for classroom teachers and administrators.

To assist in correction of these conditions three studies were made of the availability and quality of conservation education materials used in or available to California schools and teachers. These studies are:

"An Analysis of State Adopted Textbooks Relative to Conservation Education Information" (completed June 1967)

"An Analysis of Audio-Visual Materials Relative to Conservation Education" (Produced by the Los Angeles City Schools under contract with the California Department of Education, January, 1969)

"Evaluated Bibliography of Free and Inexpensive Conservation Publications" (Produced by Los Angeles County Schools under contract with the California Department of Education, May, 1969)

This report is based on these studies plus a study of the materials evaluated.

TEXTBOOKS

Basic textbooks are the most seriously deficient of all curriculum materials in conservation concepts and content. This is completely expectable because:

The Curriculum Commission criteria do not include conservation elements.

Most authors have little or no knowledge of or interest in conservation.

Many conservation-oriented authors fail to connect this interest with their major discipline, particularly if they are in the humanities, social sciences, or physical sciences.

Some conservation-oriented authors deliberately abstain from inclusion of any conservation elements and interrelations with other fields on the grounds that such materials are either out of place or dilute the major subject content of their books.

Some conservation-oriented authors include conservation elements in their books but carefully avoid use of the term which causes the value of the conservation materials to be lost to all but strongly involved and experienced teachers.

In most science texts investigations, problems, and projects are even more deficient in conservation significance than the instructional text portions of the books. Several books ostensibly directed toward enlightening pupils about man's environment devote an inordinate amount of time to outer space. Man's active environment will quite likely include at least a considerable portion of the solar system some day, but that time is in the future and most people know far too little about their present environment to live in and use it properly. Therefore, units in outer space should be continued but scaled down to a less dominant portion of textbooks that are supposed to be oriented to man's earth environment. Illustrations with conservation value are lacking in most books, and captions are even more deficient in pointing up the conservational aspects of illustrations which contain such content. The poor quality of illustrations in some texts [and the] failure to connect illustrations only because it is [not] usually done compound the illustrative deficiencies of textbooks with regard to conservation.

In order to in some measure correct these deficiencies, the Committee recommends that the State Board of Education require that:

The Curriculum Commission criteria include the integration of conservation concepts and content in all basic and supplementary textbooks in appropriate disciplines with use of the term "conservation" in such contexts.

Authors and publishers be adequately informed of this criterion.

The conservation education consultant to the State Department of Education and members of the Conservation Education Advisory Committee or conservationists approved by the Committee be included on panels of consultants for evaluation of textbooks. It should also be noted that the services of the California Resources Agency are available for consultation on the technical aspects of resource management.

Instructions to evaluators include criteria on illustrations and captions.

CURRICULUM MATERIALS

Curriculum materials for conservation are the most deficient at the elementary and intermediate grades because of the widespread attitude, among conservationists as well as others, that conservation is an "adult" field reserved for the mature, highly trained specialist in science, technology, or occasionally economics. Awareness of the need to begin to build conservation knowledge, understandings, appreciations, and habits at the earliest possible age has only recently been recognized by more than a handful of conservationists and educators and is still very limited. As a result there is relatively little quality graded material in conservation available for use below the secondary level and virtually none for the kindergarten and pre-kindergarten levels where the foundations for a conservation ethic must be laid.

The Committee recommends that the State Board of Education through the Conservation Education Service take action to encourage producers and suppliers of curriculum materials to develop quality graded materials for the pre-kindergarten to intermediate levels. Such action might be both direct—by publicity concerning the need and by revision of Curriculum Commission and other evaluative panels' criteria—and indirectly by the State Department of Education and/or the Advisory Committee.

CONSERVATION AND THE HUMANITIES

Humanities curriculum materials tend to be the most deficient in conservation emphasis and those used in the social sciences only somewhat less so. This is due to the traditional isolation of the humanities and social sciences from any consideration of the natural environment and the environmental related physical, earth, and life sciences. Similar deficiencies occur in curriculum material used in the physical, earth and life sciences which have traditionally disregarded the interrelationships and interaction of these fields with the humanities and social sciences.

The Board and Department of Education has the responsibility to acquaint authors and publishers of the necessity for including references to conservation and to the interrelationships and interaction of these several fields in all curriculum materials. Such action might include:

Obtaining support of the State Department of Education for authors' workshops and other activities under its auspices.

Actively enlisting the cooperation of the institutions of higher education in California to present courses, workshops, institutes, exhibits, and other activities for educators and authors.

Including these elements in Curriculum Commission and other evaluative panel criteria.

AUDIO-VISUAL MATERIALS

Among audio-visual materials with conservation education value, too little has been done to develop and utilize media materials such as three-dimensional models, simulation models, stereo-photographs, multi-media and multi-screen and audio materials with conservation value.

Producers of audio-visual materials should be encouraged by direct and indirect means to make fuller utilization of these technological innovations in producing materials suitable for conservation instruction.

RESOURCE ECOLOGY EMPHASIS

When available curriculum materials contain conservation concepts and content their approach and concept of the term tends to be narrow and mechanistic. Conservation is too often presented as either the simple application of science via technology, as nothing more than resource use, or as a purely economic problem. This leads to inadequate consideration of cause-effect relationships; disregard of the fact that actions which are beneficial in the short run are sometimes harmful over longer periods of time; slighting or completely ignoring the interrelations, interactions, and interdependence of man and his resources. The consequence of this is that the ecology of resources is passed over or ignored completely.

USE OF THE TERM CONSERVATION

Presentation of conservation concepts and content is often so vague that only an experienced and conservation-oriented teacher can recognize them. Evaluators of curriculum materials adopted or recommended by the State Board should ensure that conservation concepts and content are clearly presented and identified as such. Evaluation panels should include conservationists approved by the Conservation Advisory Committee in order to implement this recommendation. Producers of free and inexpensive materials and other items not subject to statewide review should be encouraged through the Department of Education Conservation Service to present conservation concepts and content clearly with use of the term in appropriate contexts. Such material should be reviewed and updated periodically.

FACTUAL AND CONCEPTUAL ACCURACY

Errors of approach and concept appear too often. These include presenting as strong possibility or even established fact that (a) man can control nature (b) that science and technology can provide all of the needed solutions to conservation problems (c) that resource use constitutes conservation and (d) that change and progress are identical. The Curriculum Commission and other evaluative panels should require correction of such errors just as they require correction of content errors in other fields.

FREE AND INEXPENSIVE MATERIALS

Supplementary texts, audio-visual materials, and free and inexpensive materials as a whole present conservation concepts and content more effectively than do most textbooks in the life and social science fields. Unfortunately a large proportion of the free and inexpensive materials are ephemeral in that supplies are exhausted and replaced by new items long before their value has ended. This creates problems for potential users of materials and therefore inhibits effective teaching of conservation. Producers of such materials should be aware of these problems and should seek to produce materials of sufficient quality and in sufficient quantity to permit their use in educational programs over a reasonable period of time.

Suppliers of free and inexpensive materials are widely dispersed and highly specialized. This makes it very difficult and costly for the classroom teacher to locate needed materials.

A series of conservation materials centers as recommended in Section V would help to remedy this situation. . . .

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the ENVIRONMENTAL PROBLEM

SELECTIONS FROM THE HEARINGS

During March, April and May of 1970, the Select Subcommittee on Education of the U.S. House of Representatives held hearings in Washington, D.C., New York City, and San Francisco and Los Angeles, California, on a "bill to authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance."

The record of these hearings contains testimony from a wide cross-section of the population concerned with environmental quality and education—ecologists such as LaMont Cole; social scientists, such as Margaret Mead and Kenneth Boulding; student leaders of the Environmental Teach-In, such as Karen Buxbaum, Dennis Hayes, and Bryce Hamilton; and artist, Robert Motherwell; a theologian, Joseph Sittler; educators, such as Edward Weidner; government officials, such as James E. Allen; and many others—philosophers, conservationists, businessmen, architects, journalists, teachers. The testimony ranges from very high-level, abstract, global thinking to detailed descriptions of specific action programs. The record has been carefully edited and condensed in order to present the essential themes, a wide variety of viewpoints, and dramatic encounters found in the record of these exceptionally invigorating and enlightening hearings.

There are many uses for such a book: curriculum planners and teachers will find many of the proposals helpful in guiding their own thinking; both high school and college classes in education and government will find this an illuminating source of information on how national priorities are formulated; and study groups focusing on environmental problems will find it a stimulating case study.

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